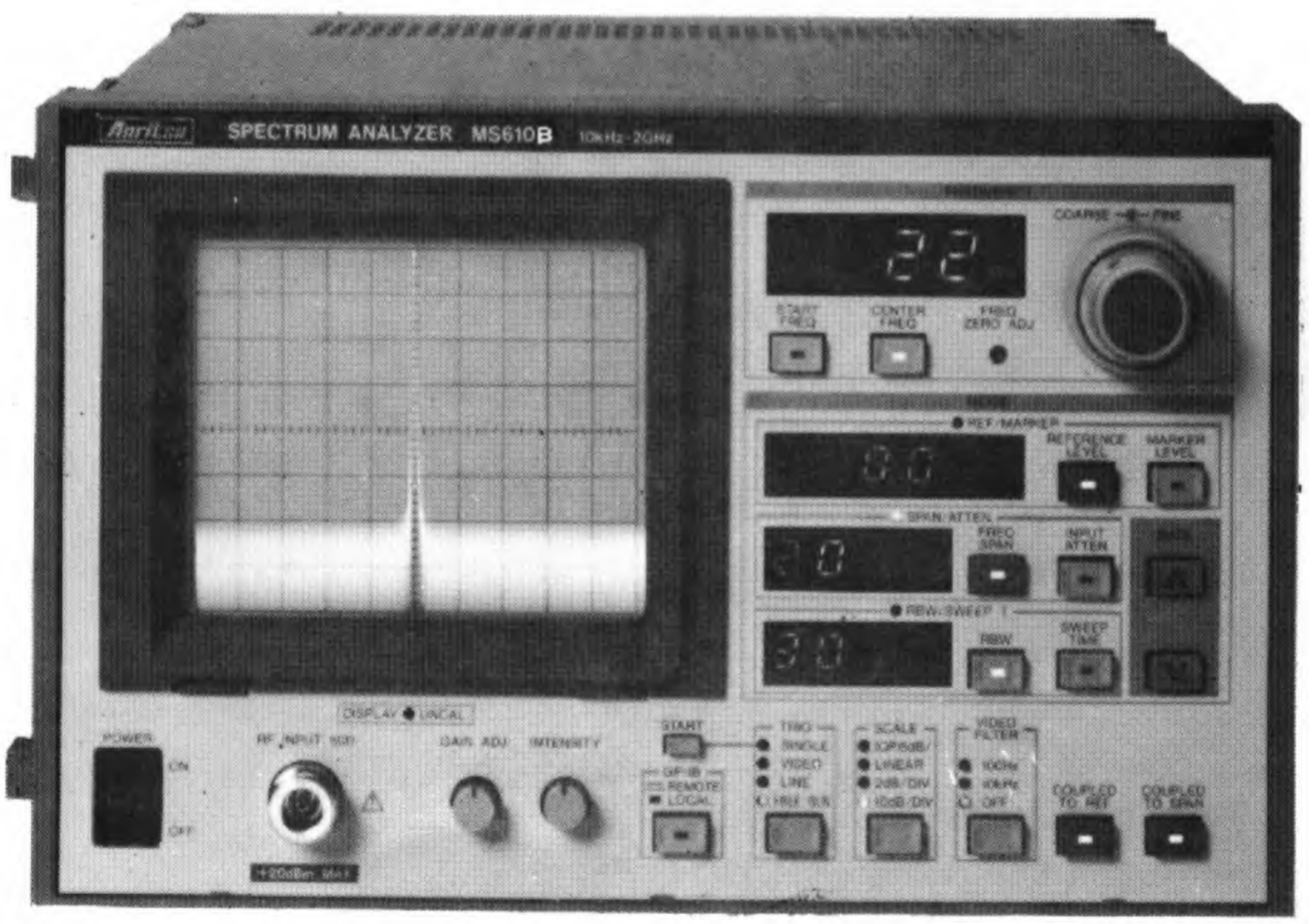
SERVICE MANUAL

SPECTRUM ANALYZER

MS610B/J/J1



ANRITSU CORP.

1986.10 x 200 NII-2(Y)
Printed in Japan

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GENERAL

This is the service manual for the MS610B/J/J1 Spectrum Analyzer. It gives the following information:

SECTION 2, MECHANICAL CONFIGURATION AND AC POWER RATING CHANGES:

This section describes the assemblies of the various printed circuit boards (PC boards), and changing the ac line voltage rating.

SECTION 3, CIRCUIT DESCRIPTION:

This section describes electrical operation.

SECTION 4, CIRCUIT DIAGRAM:

This section gives the block diagrams and circuit diagrams for troubleshooting.

SECTION 5, ADJUSTMENT:

This describes instrument adjustment after repair or performance check failure.

SECTION 6, REPLACEABLE PARTS:

This lists the parts given in the circuit diagrams and explains ordering of replacement parts.

Note:

A service kit is available (sold separately). It is comprised of extender cables and connector adapters (see APPENDIX A).

SECTION 2

MECHANICAL CONFIGURATION AND AC POWER RATING CHANGES

2.1 Mechanical Configuration

Table 2-1 lists the mechanical parts. Figures 2-1 to 2-11 show exploded views of the MS610B/J/J1.

CAUTION

Before disassembling/reassembling the MS610B/J/J1, turn OFF the POWER switch on the front panel and disconnect the power supply cord from the ac outlet.

The various figures and mechanical parts list are given below.

Table 2-1 Mechanical Parts List

Fig. 2-1 Cabinet Assembly
Fig. 2-2 Front Panel Assembly
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Fig. 2-5 CRT Drive Unit Assembly
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Fig. 2-9 RF Unit Assembly
Fig. 2-10 IF Section Unit Z3 Assembly
Fig. 2-11 Rear Panel Assembly

Table 2-1 Mechanical Parts List

No.	Part No.	Description	Remark	Qty.	Fig. No.
1	32B7680A	frame, front	2/3 MW-4U	1	2-1
2	32B7666	channel, rear	4U	2	2-1
3	33B20662	protector		4	2-1
4	34B73668	nut, front		4	2-1
5	32B7668	channel, top	350D	2	2-1
6	32B7669	channel, bottom	350D	2	2-1
7	322B7672	foot, standard		4	2-1
8	34B73660C	tape, trim	4U	2	2-1
9	349B73661B	handle, side	350D	1	2-1
10	33B22621B	cover, top		1	2-1
11	33B22461B	cover, bottom		1	2-1
12	33B22471	cover, side, right		1	2-1
13					
14					
15	44E80830	key top		3	2-2
16	442E80831	key top		7	2-2
17	442E80831B	key top		4	2-2
18	342E84185	key top		2	2-2
19	44E79340	key top		1	2-2
20	342E73701	knob		2	2-2
21					
22					
23	349B86530	CRT cover	with CRT filter	1	2-3
24	342E84186	knob	small	1	2-3
25	342E84187	knob	large	1	2-3
26	34B78330B	clamp, panel	bottom	3	2-3
27	34B78330	clamp, panel	top	3	2-3
28	32B9274B/C	panel, front	B: MS610B, C: MS610J/J1	1	2-3
29	322B9275	panel, sub		1	2-3
30					

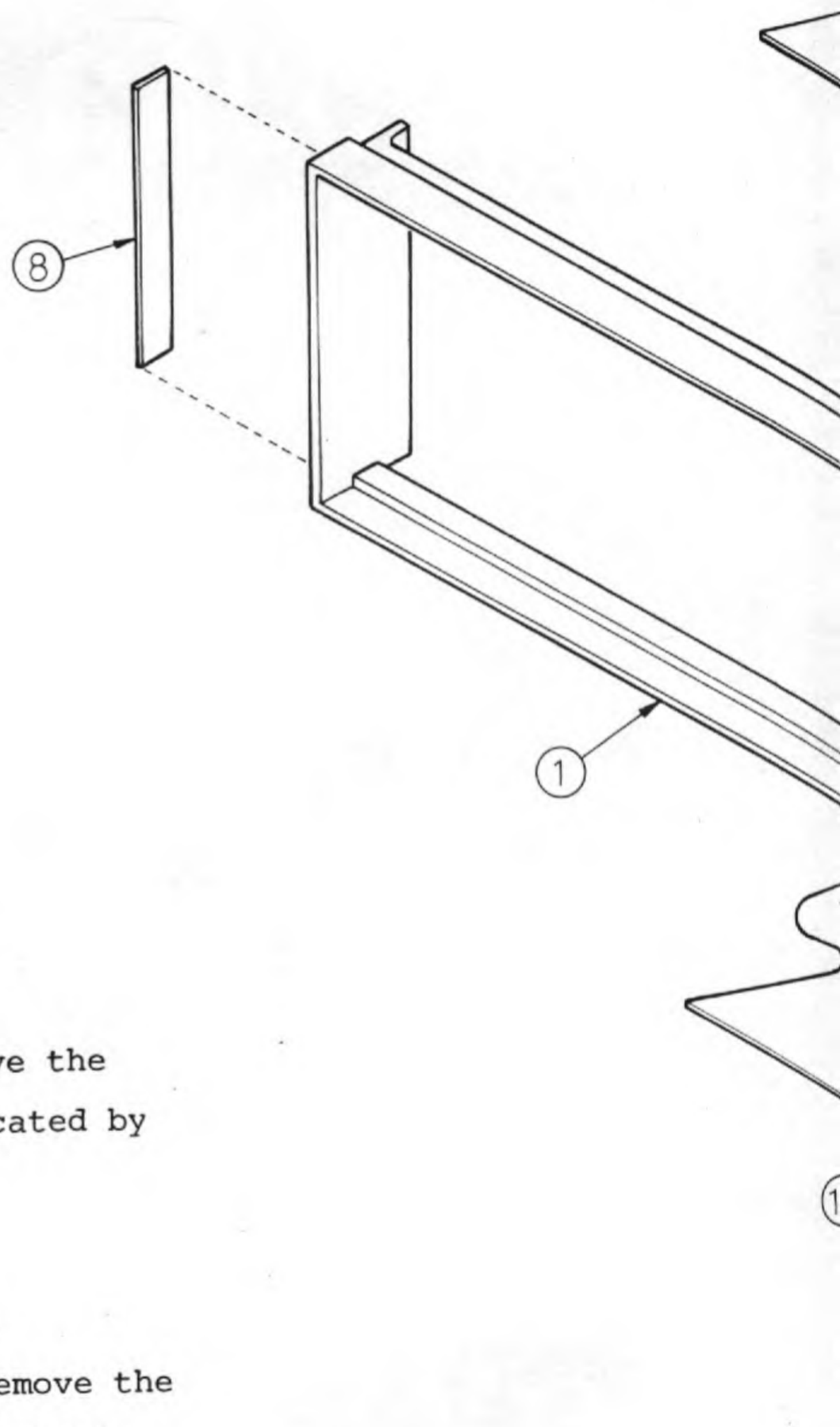
Table 2-1 Mechanical Parts List (Continued)

No.	Part No.	Description	Remark	Qty.	Fig. No.
31	33B25809B	cover, side left		1	2-5
32	33B25818	shield cover		1	2-5
33	33B3689B	pillar		2	2-5
34	34E84192	foot, side		4	2-5
35					
36					
37					
38	34B84020	shield cover		1	2-8
39					
40	33B25816	shield panel		1	2-10
41					
42	332B25810A/B	panel, rear	A: MS610B, B: MS610J/J1	1	2-11
43	34B73670	cord winder		4	2-11

Cabinet Assembly

(1) Top cover (10) removal

Remove the two screws (S1). Then, remove the top cover (10) by lifting it forwards from the rear in the direction indicated by the arrow*.



(2) Bottom cover (11) removal

Remove the two screws (S2). Then, remove the bottom cover (11) from the rear as indicated by the arrow*.

(3) Right side cover (12) removal

Open the cover of the handle (9) in the direction indicated by the arrow* and remove the two screws (S3). Then, remove the four screws (S4) and remove the side cover.

Cabinet Assembly

(1) Top cover (10) removal
Remove the two screws (S1). Then, remove the top cover (10) by lifting it forwards from the rear in the direction indicated by the arrow*.

(2) Bottom cover (11) removal
Remove the two screws (S2). Then, remove the bottom cover (11) from the rear as indicated by the arrow*.

(3) Right side cover (12) removal
Open the cover of the handle (9) in the direction indicated by the arrow* and remove the two screws (S3). Then, remove the four screws (S4) and remove the side cover.

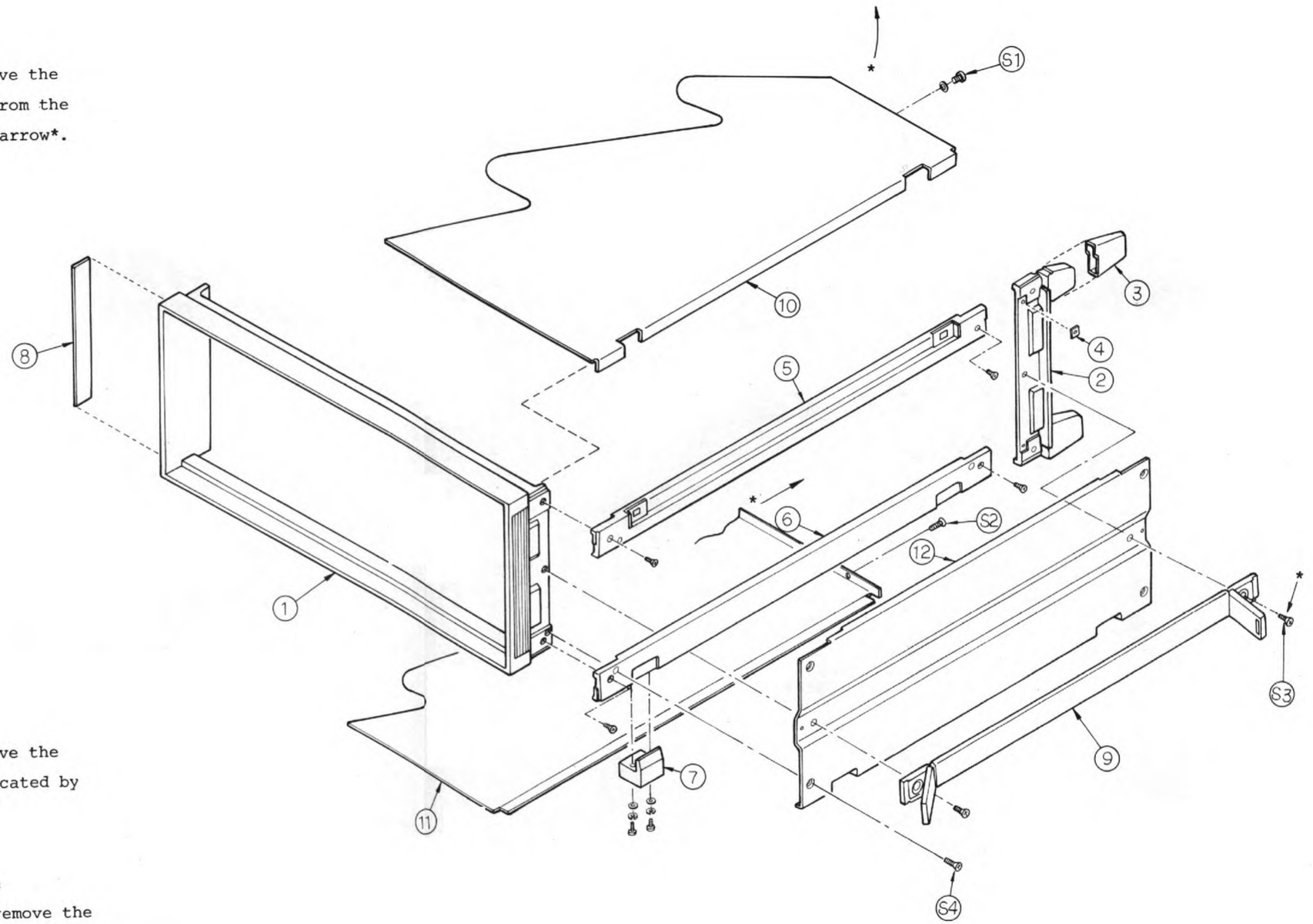


Fig. 2-1 Cabinet Assembly

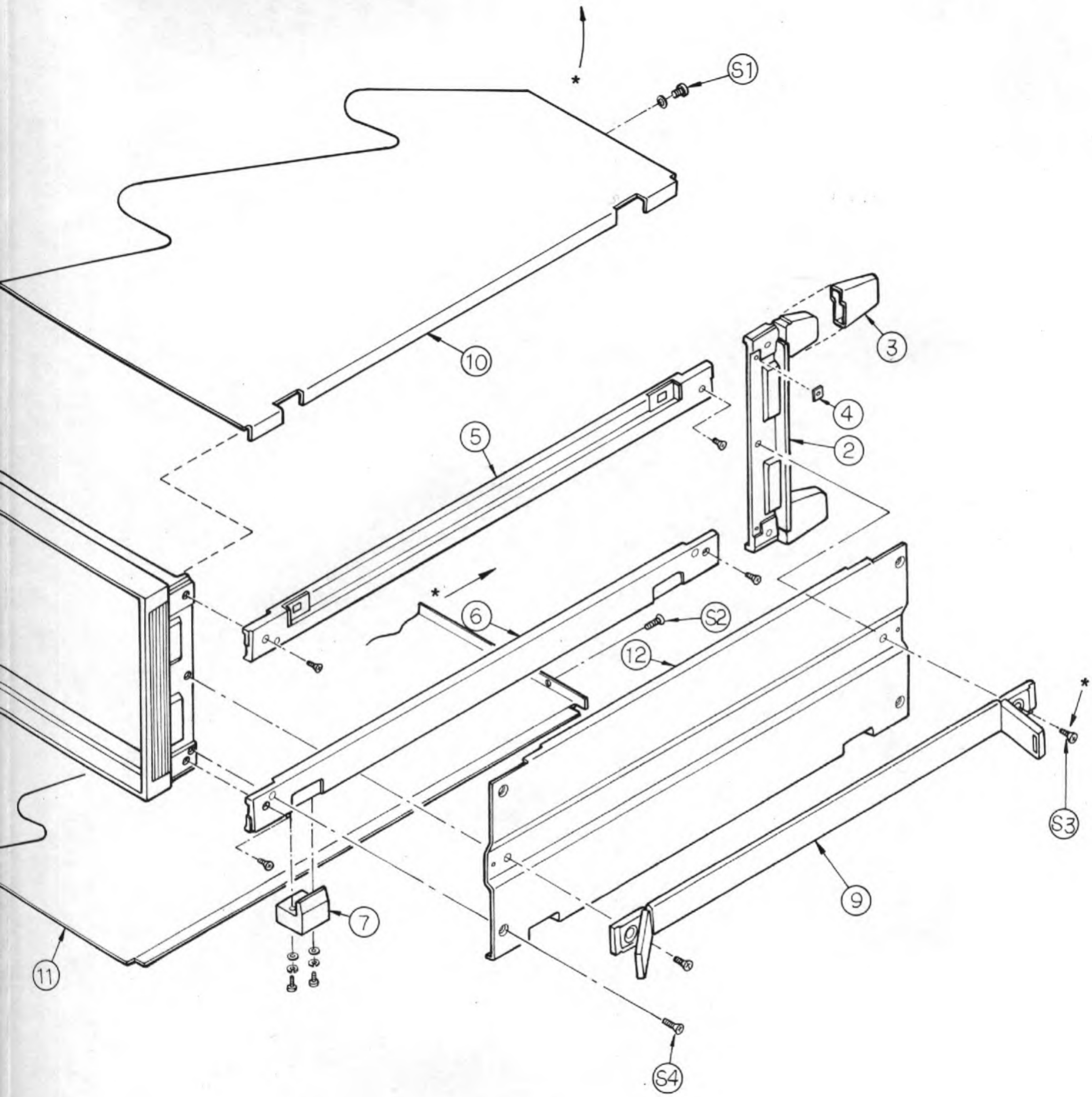
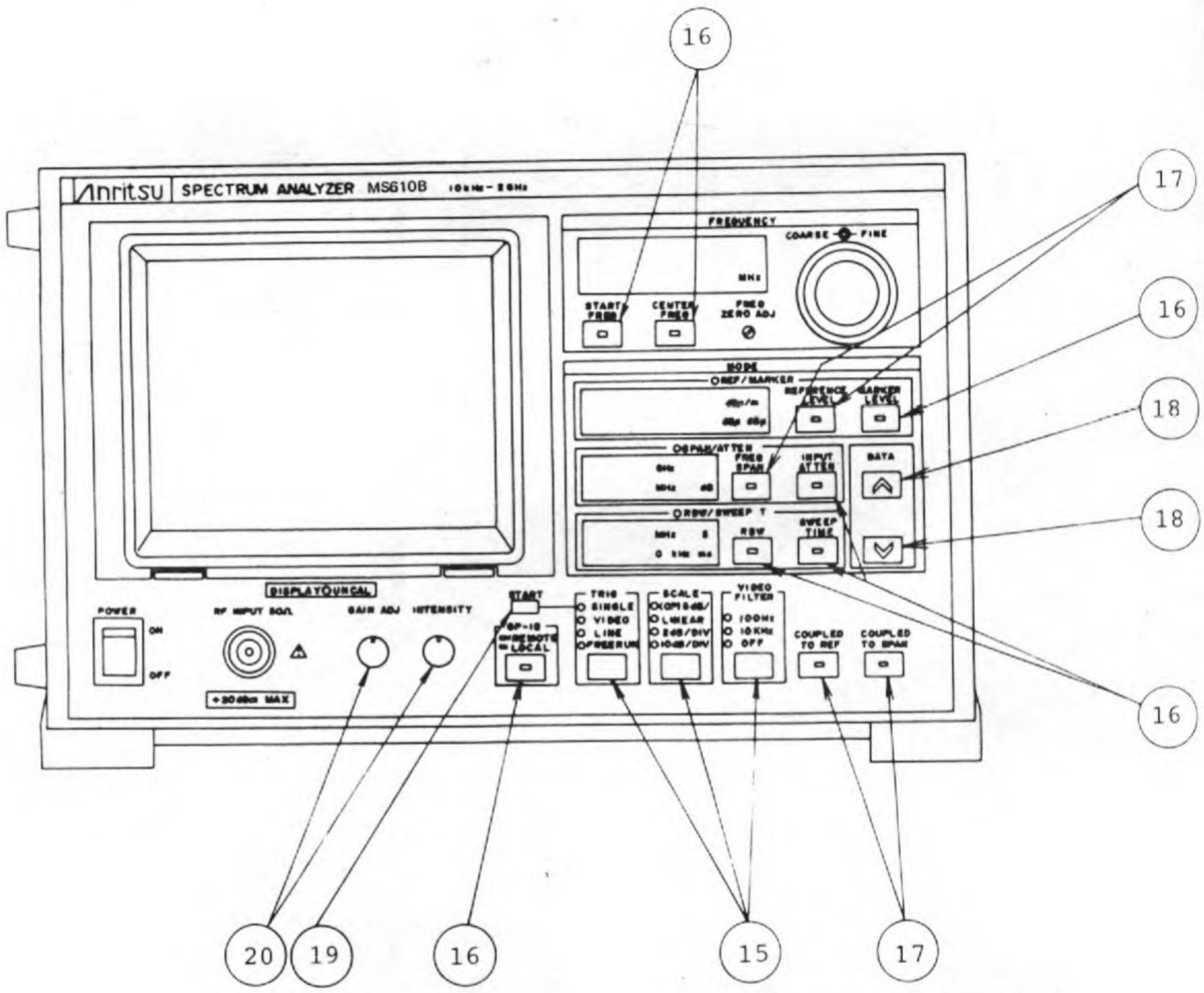


Fig. 2-1 Cabinet Assembly


16
Anritsu
SPECTRUM ANALYZER MS610B
FREQUENCY
COARSE
FINE
START FREQ
CENTER FREQ
FREQ ZERO ADJ
MODE
REF / MARKER
REFERENCE LEVEL
MARKER LEVEL
SPAN/ATTEN
FREQ SPAN
INPUT ATTEN
DATA
RBW/SWEEP T
RBW
SWEEP TIME
DISPLAY CAL
POWER
ON
OFF
RF INPUT 50Ω
+20dBm MAX
GAIN ADJ
INTENSITY
START
GP-IB
REMOTE
LOCAL
TRIG
SINGLE
VIDEO
LINE
FREERUN
SCALE
LINEAR
2dB/DIV
10dB/DIV
VIDEO FILTER
100Hz
10KHz
OFF
COUPLED TO REF
COUPLED TO SPAN
17
16
18
18
16
20
19
16
15
17

Front Panel Assembly

When replacing key tops (15) through (19), remove them with a pair of pliers as shown in the figure.

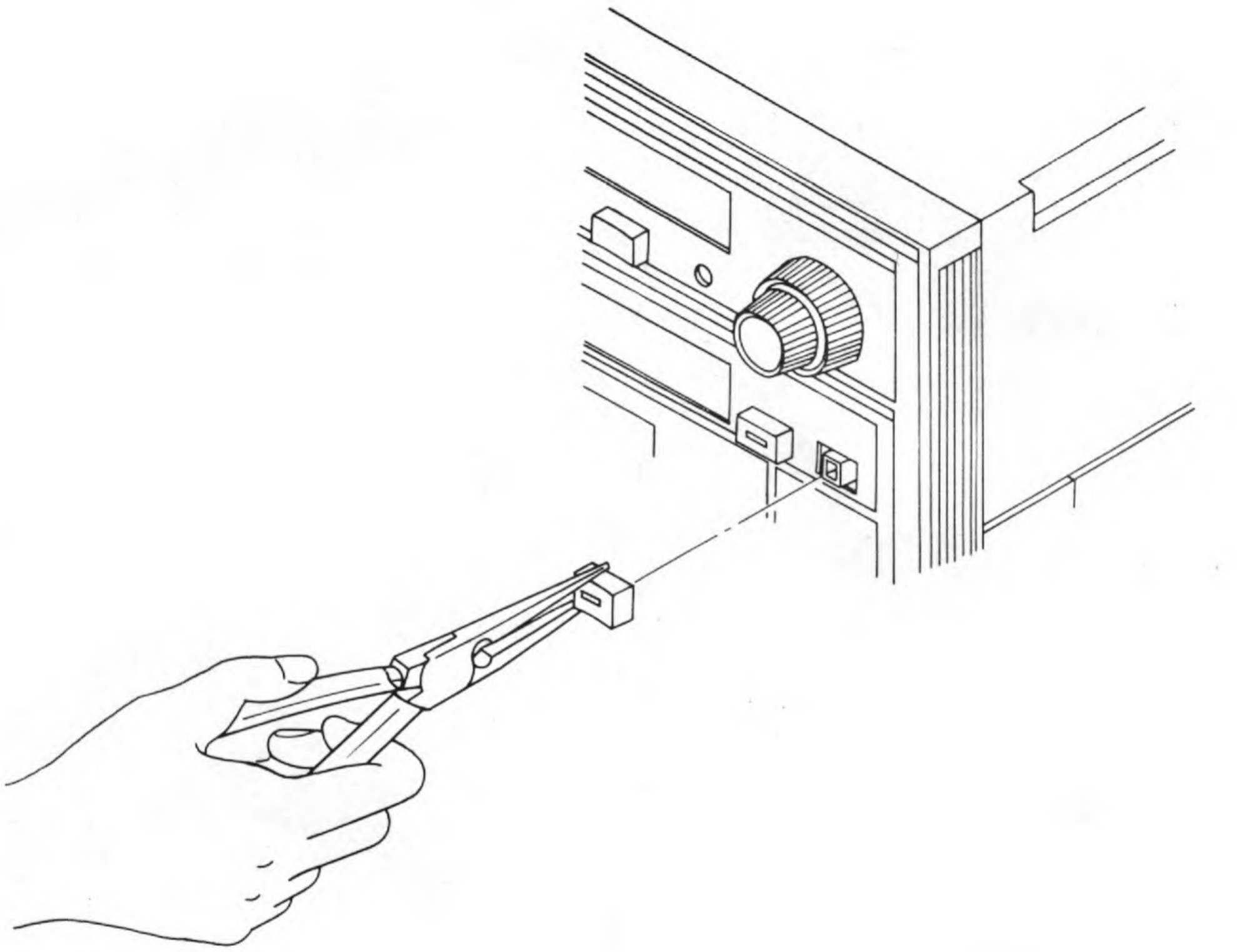
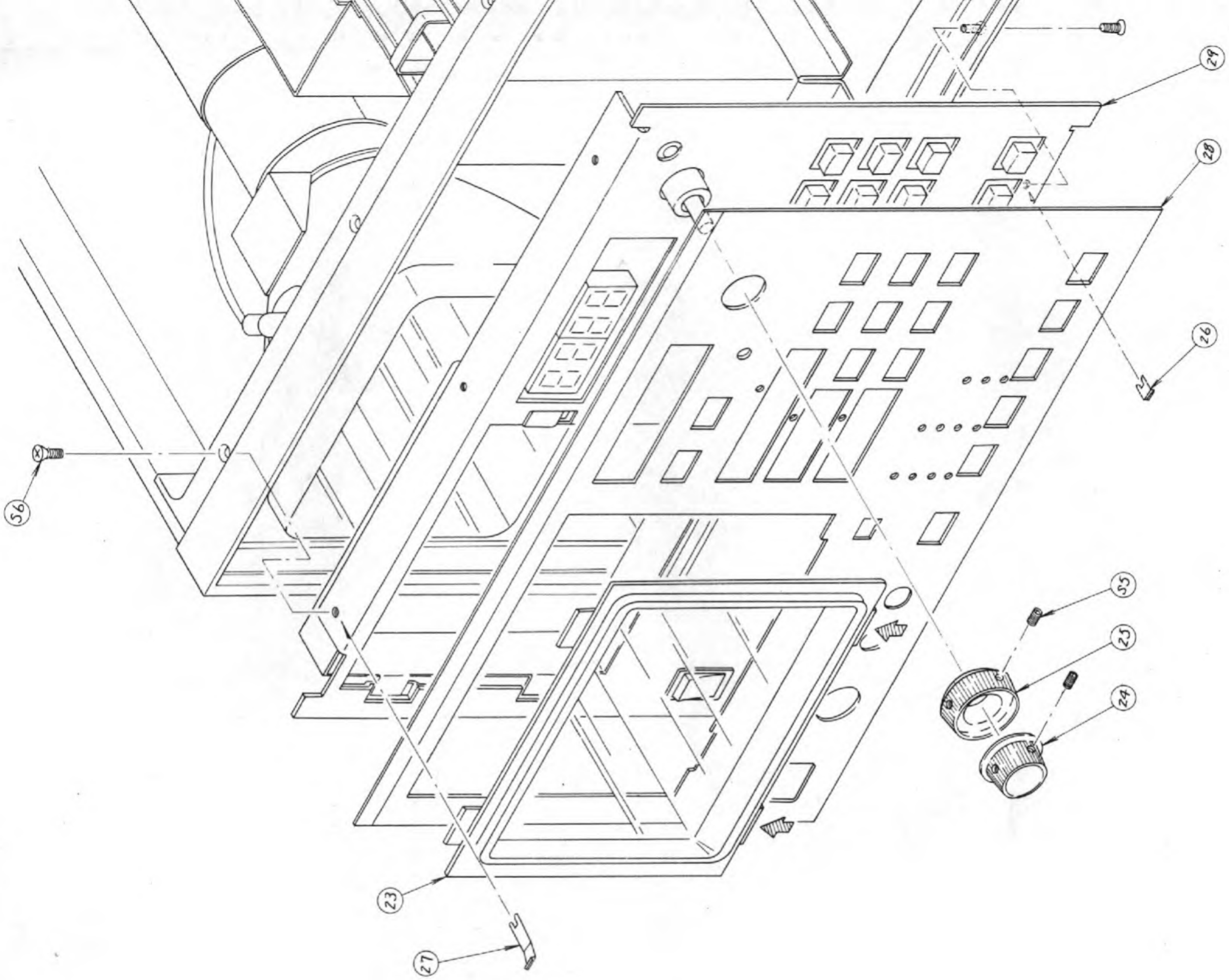


Fig. 2-2 Front Panel Assembly


29
28
26
56
35
25
24
23
27

Front Panel Assembly

(1) Lift the lower part of the CRT cover (23) in the direction indicated by the arrows and remove it.

(2) Loosen both set screws (S5) for knobs (24) and (25), and then remove both knobs.

(3) Remove the six screws (S6). Then pull and remove the six panel clamps (26) and (27). Remove the front panel (28).

(4) Disconnect the connectors and wires connected to the front panel. (J29, J17 (Fig. 2-4), J16 (Fig. 2-10), Power switch cable (Fig. 2-5))

(5) Remove the sub panel (29).

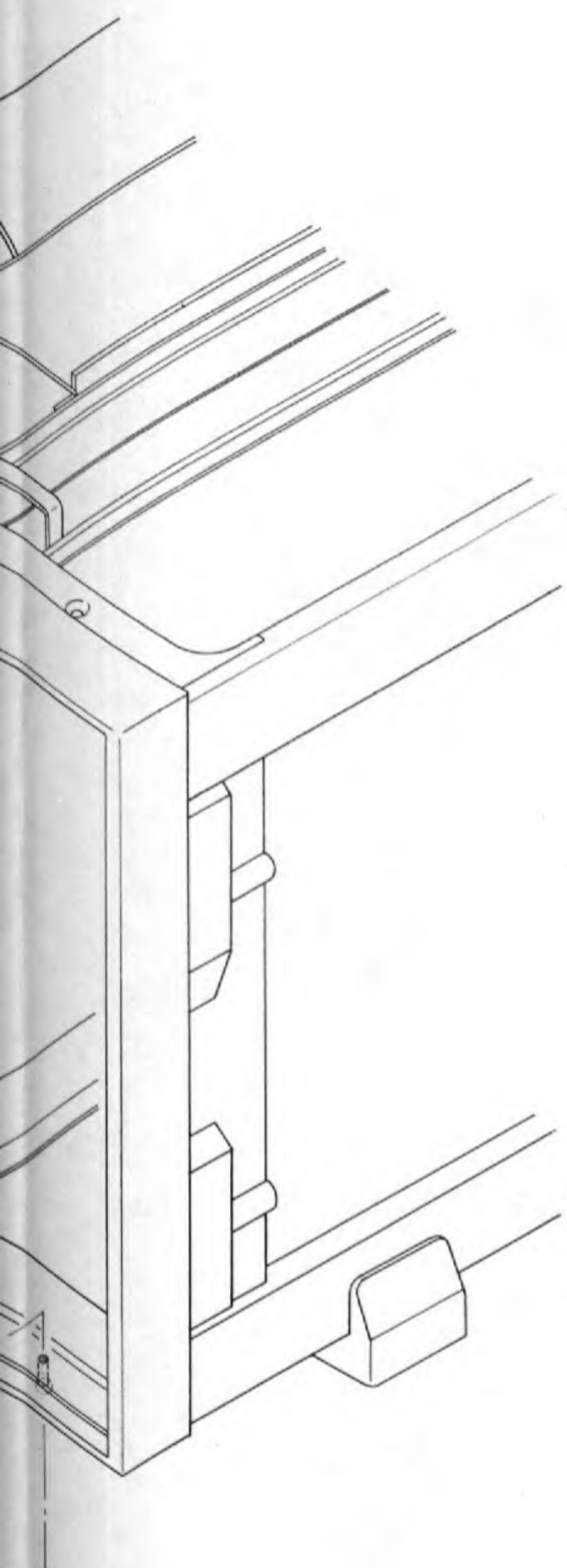
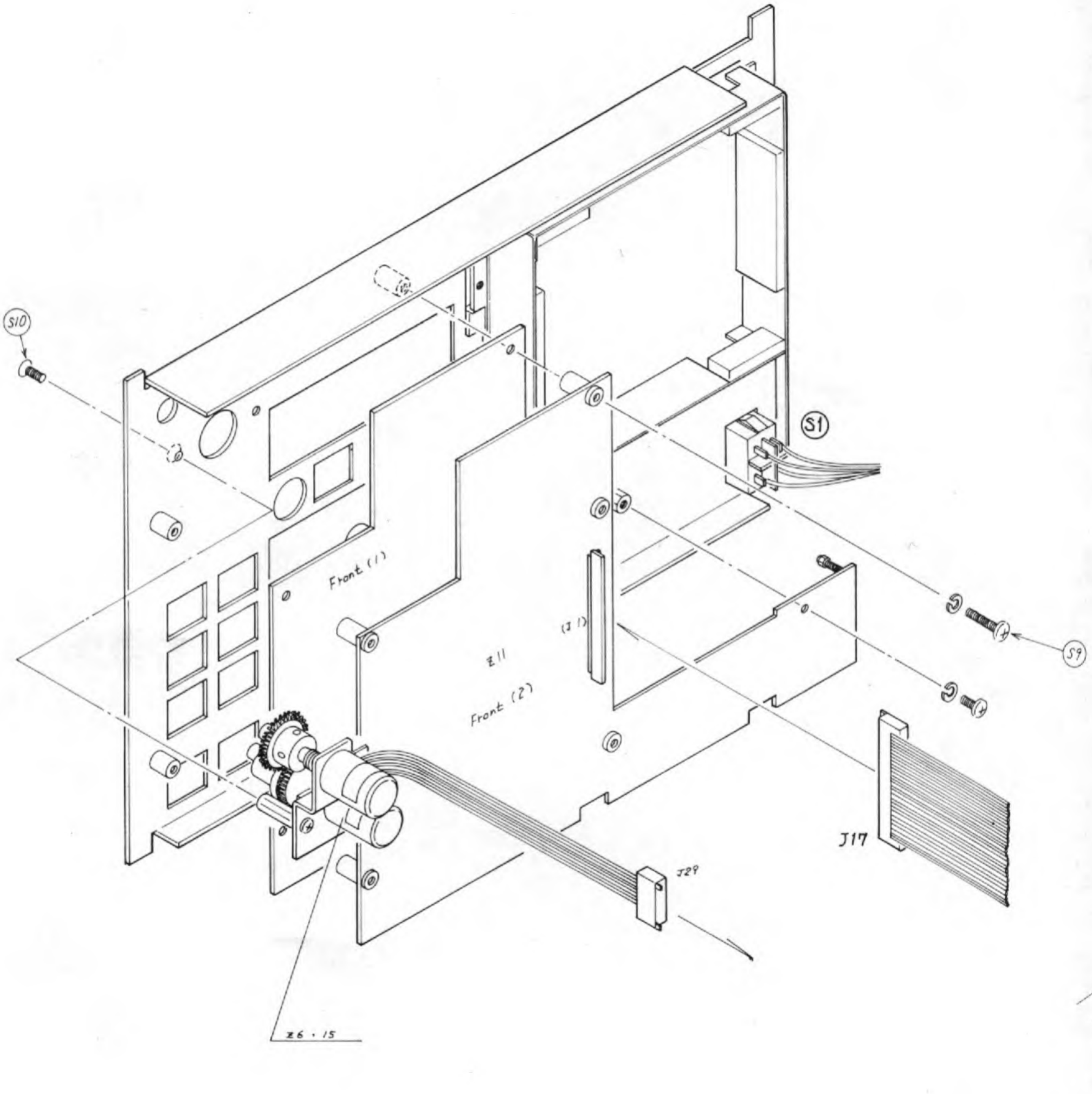


Fig. 2-3 Front Panel Assembly (continued)


S10
S1
Front (1)
Z11
(J1)
Front (2)
S9
J17
J29
Z6 · 15

Front Panel Assembly

(1) Remove the six screws (S9) and then remove the front unit Z11.

(2) Remove the two screws (S10) and then remove the frequency volumes Z6 and Z15.

(3) Remove the power switch (S1).

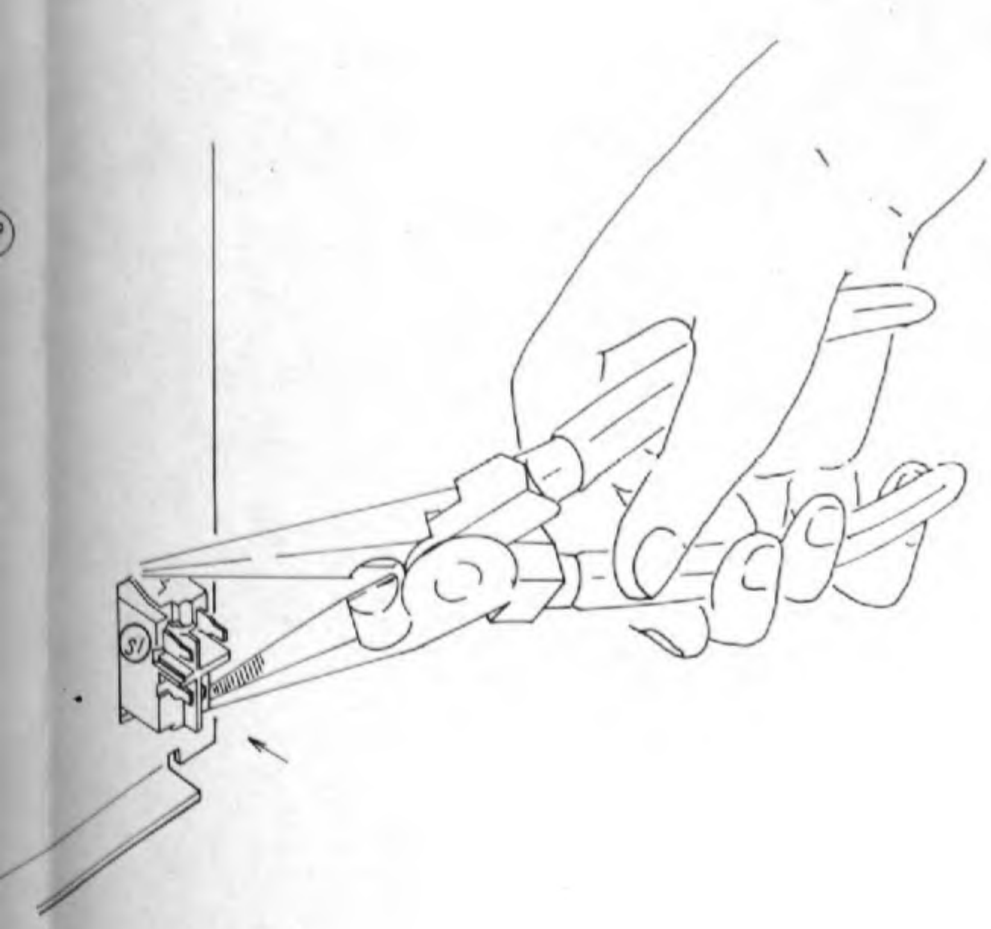
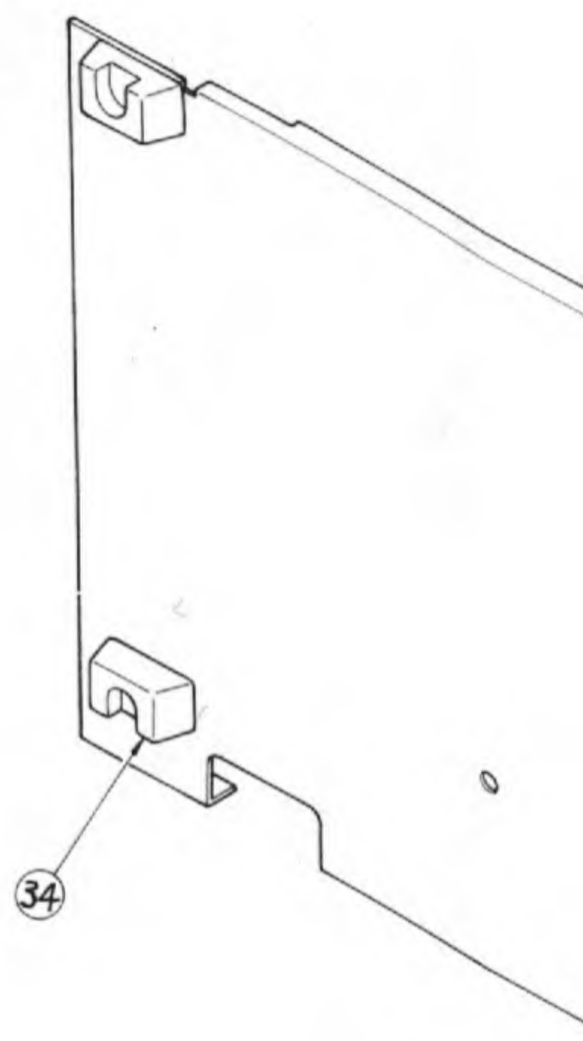


Fig. 2-4 Front Panel Assembly (continued)



CRT DRIVE UNIT Assembly

(1) Remove the four screws (S11) and remove the left side cover (31).

(2) Remove the four screws (S12) and remove the shield cover (32).

(3) Disconnect the five connectors J9, J22, J11, J19, J21 and CRT anode (Fig. 2-6).

(4) Remove the four screws (S13) and the two pillars (33). Then, remove the CRT DRIVE unit Z12.

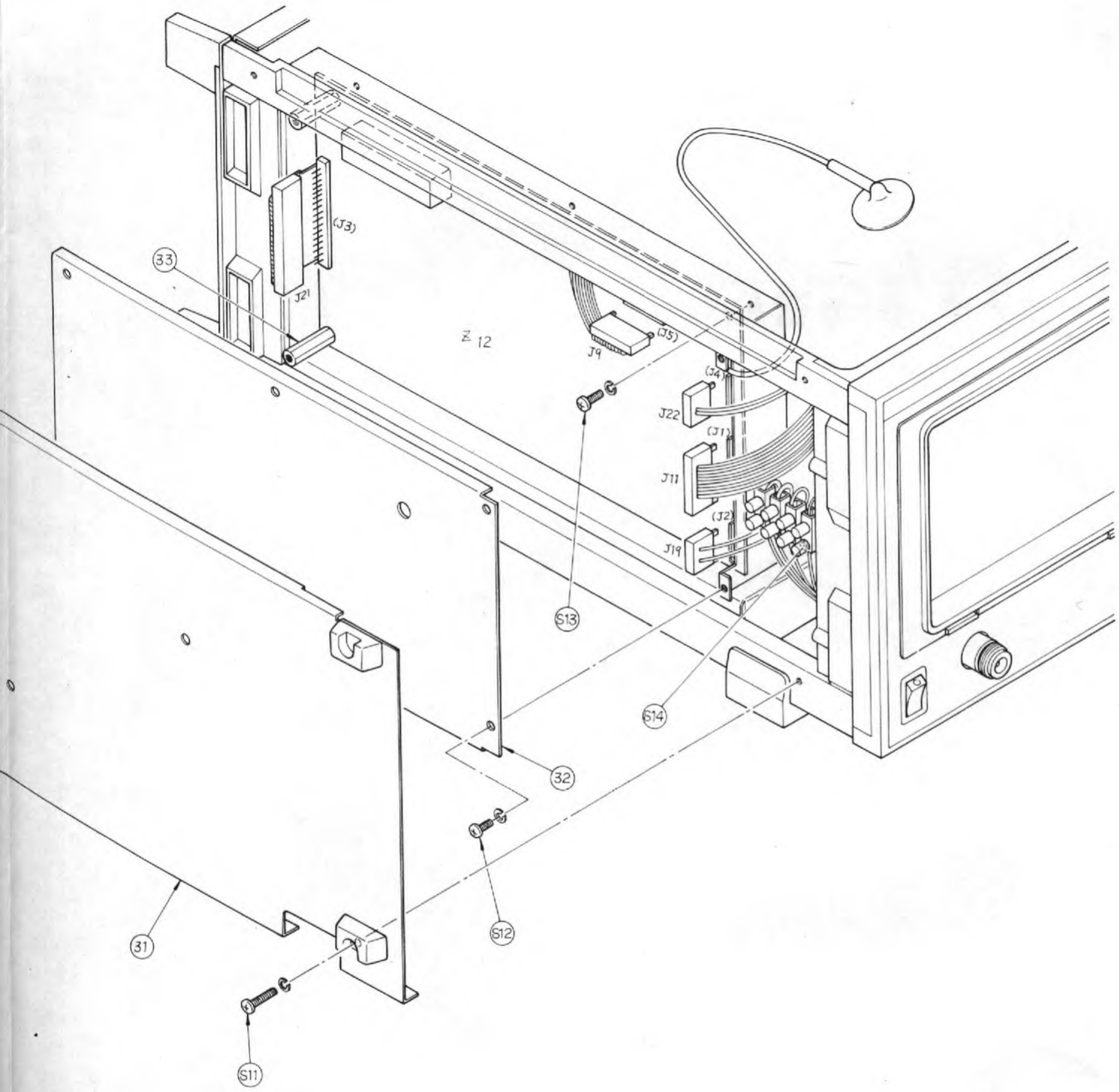
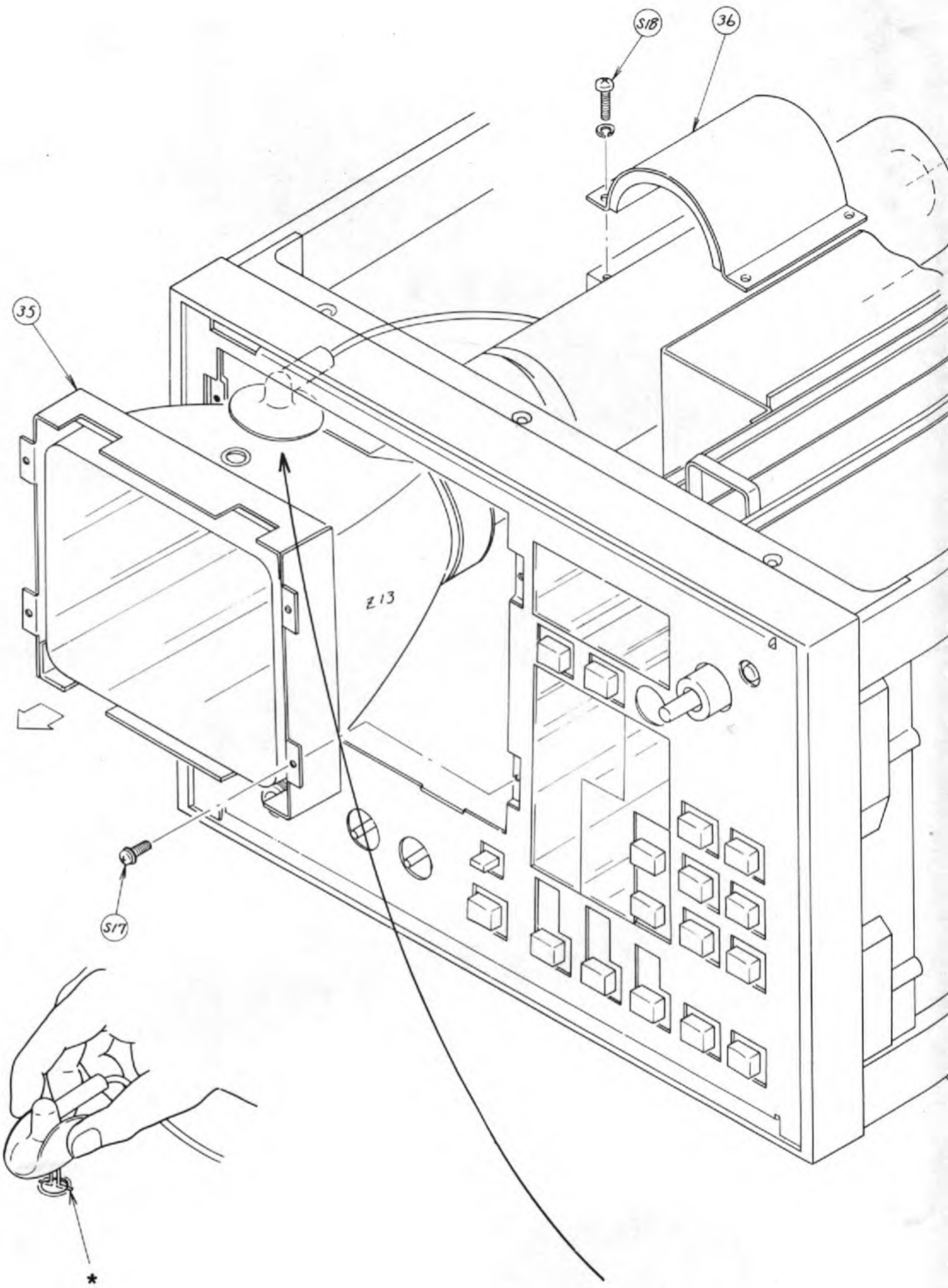


Fig. 2-5 CRT DRIVE UNIT Assembly



CAUTION

Before removing the anode
the high voltage line * wi
or similar item.

CRT DISPLAY UNIT Z13 Assembly

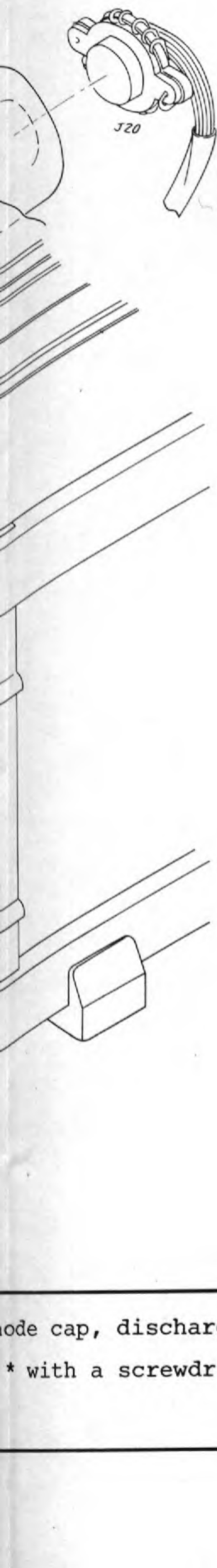
(1) Remove the front panel (28) as in Fig. 2-3.

(2) Remove the CRT anode cap (see CAUTION).

(3) Remove the four screws (S17) and remove the CRT frame (35).

(4) Remove the four screws (S18) and remove the CRT clamp (36).

(5) Disconnect the connector J22 connected to the CRT drive as in Fig. 2-5. Then, pull out the CRT and disconnect the CRT socket J20.



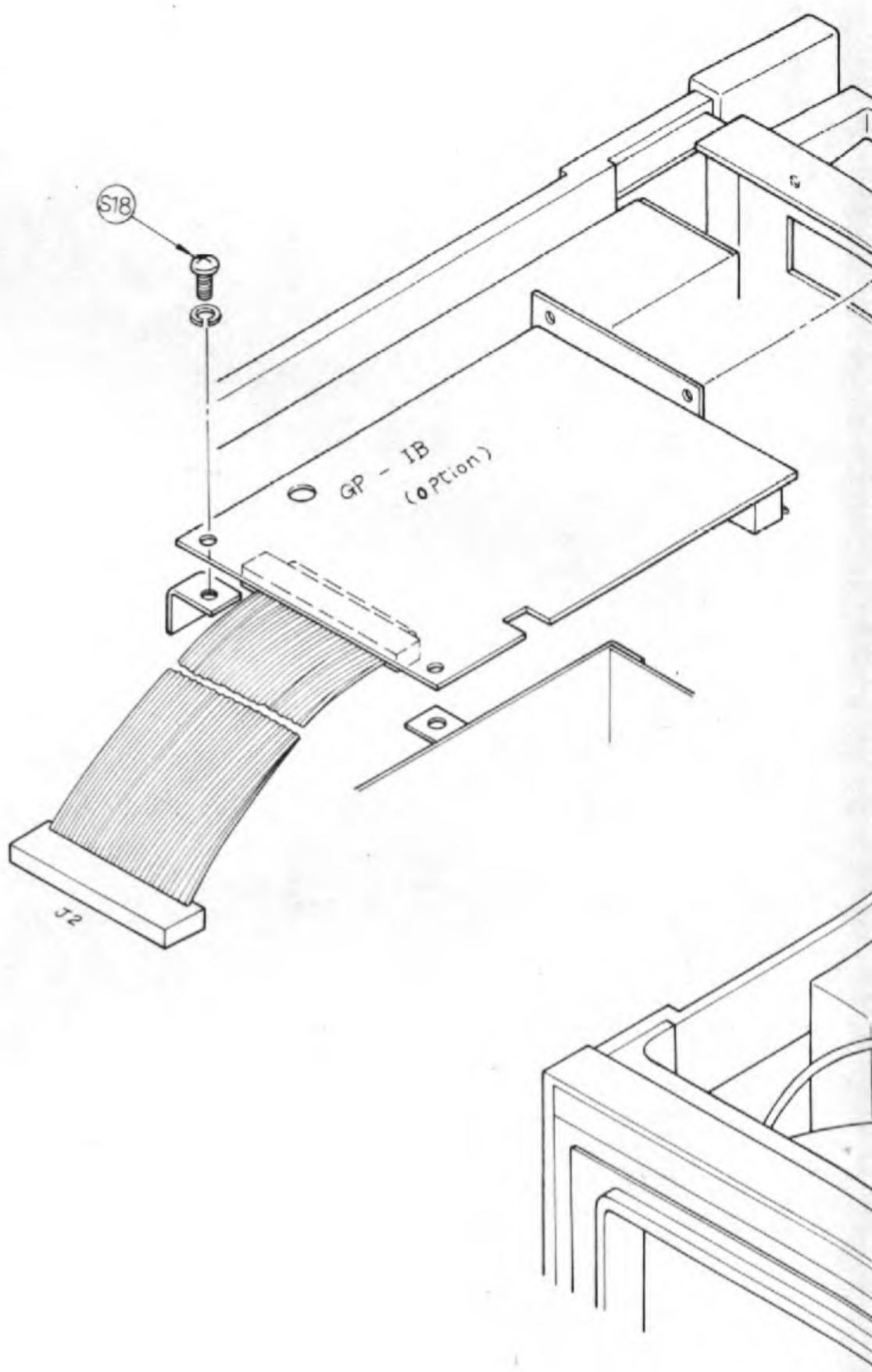
ode cap, discharge
* with a screwdriver

Fig. 2-6 CRT DISPLAY UNIT
Z13 Assembly

GP-IB UNIT Assembly

(1) Remove the four screws (S18) and then remove the GP-IB unit.

(2) Remove connector J2.



CPU and SCAN UNIT Z9, Z10 Assembly

(1) Disconnect the six connectors (J2, J11, J12, J13, J15 and J17).

(2) Lift out the units Z9 and Z10 using the handles.

POWER SUPPLY UNIT Z7 Assembly

(1) Disconnect the three connectors (J4, J9 and J20).

(2) Lift out the unit Z7.

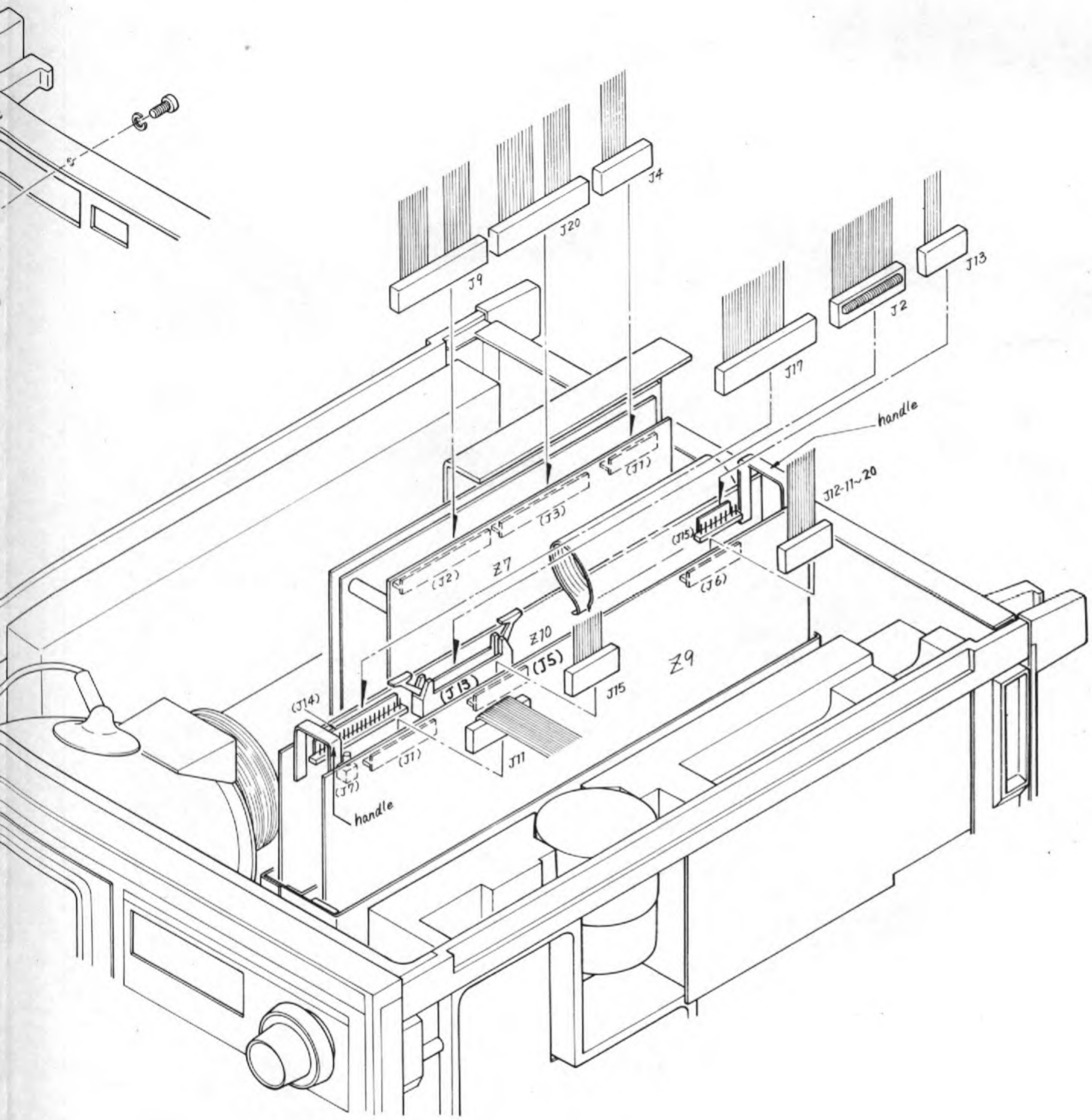
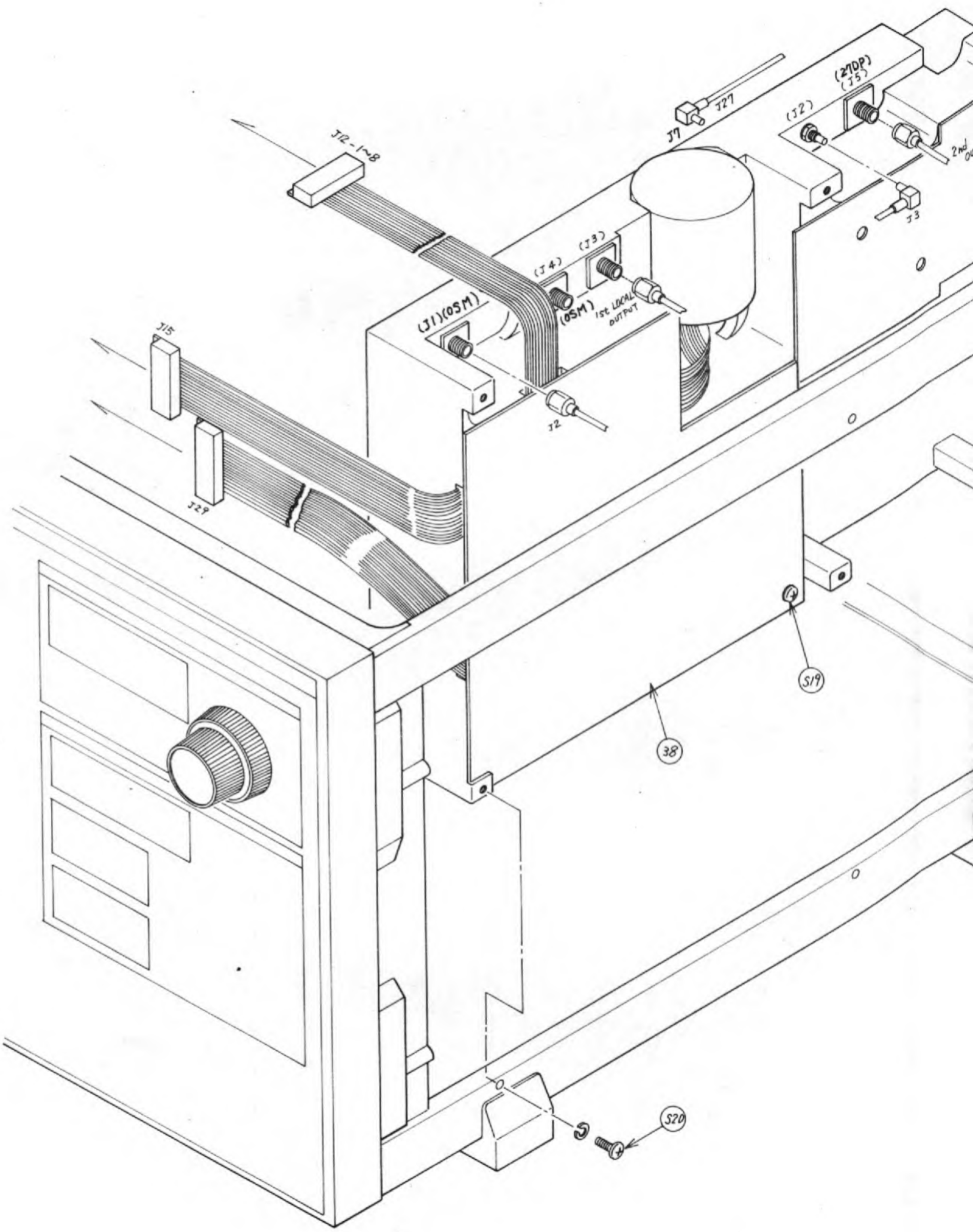
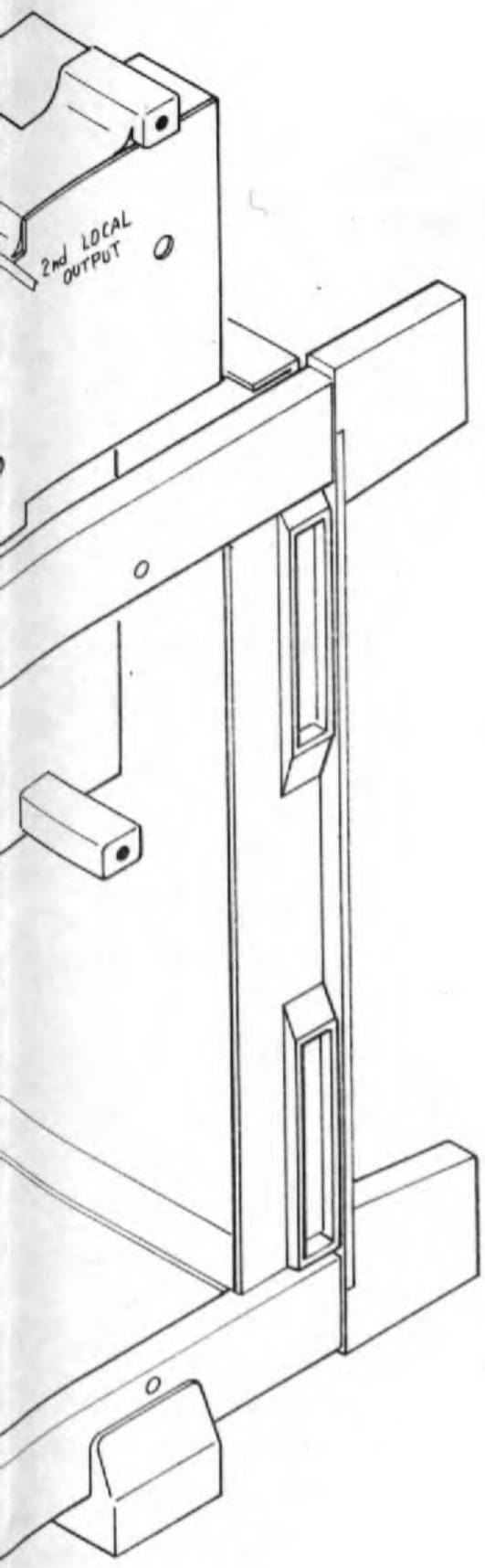


Fig. 2-7 CPU and SCAN UNIT Z9, Z10 Assembly


J12-1~8
J7
J27
(J7DP)
(J5)
(J2)
2nd LOCAL OUTPUT
J3
(J4)
(J3)
(J1)(OSM)
(OSM)
1st LOCAL OUTPUT
J15
J29
J2
S19
38
S20

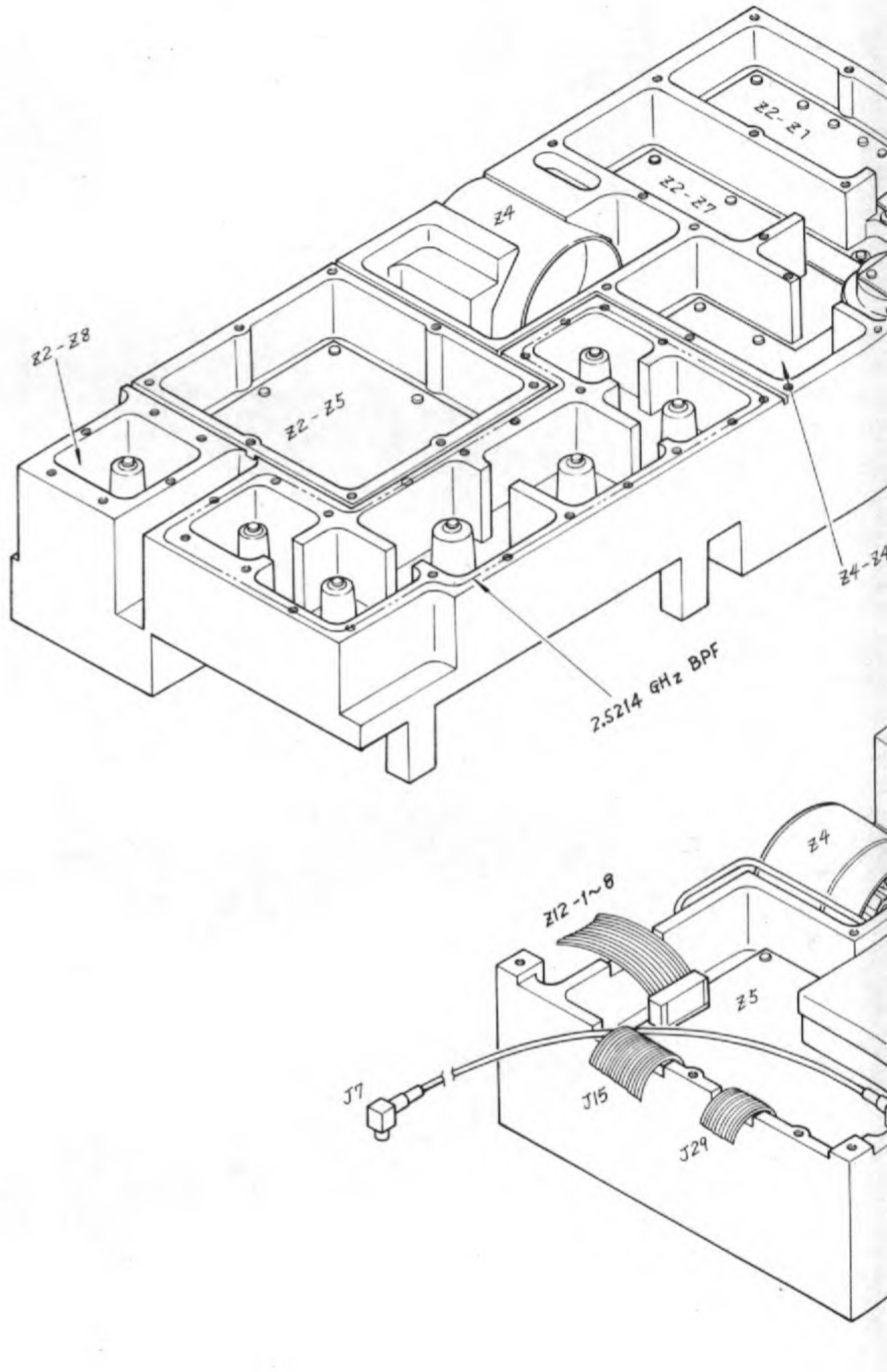


RF UNIT Assembly

(1) Remove the screws (S19) and open the shield cover (38). Then, disconnect the three connectors (J12, J15 and J29).

(2) Disconnect the coaxial connectors (J2, J3, J27, 1st and 2nd LOCAL OUTPUT), and remove the six screws (S20). Then, remove the RF Block.

Fig. 2-8 RF UNIT Assembly


Z2-Z1
Z2-Z7
Z4
Z2-Z8
Z2-Z5
Z4-Z3
2.5214 GHz BPF
Z4
Z12-1~8
Z5
J7
J15
J29

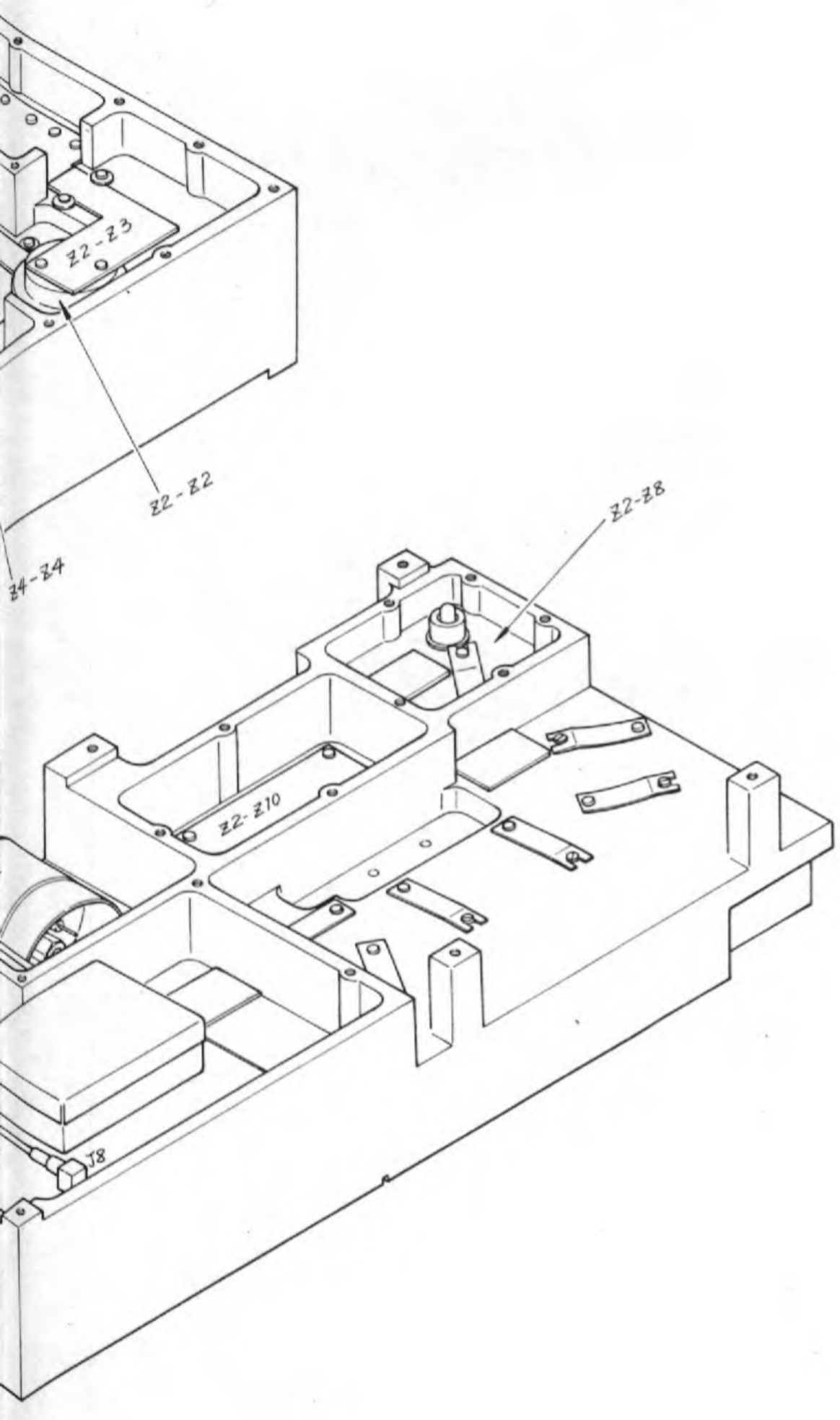
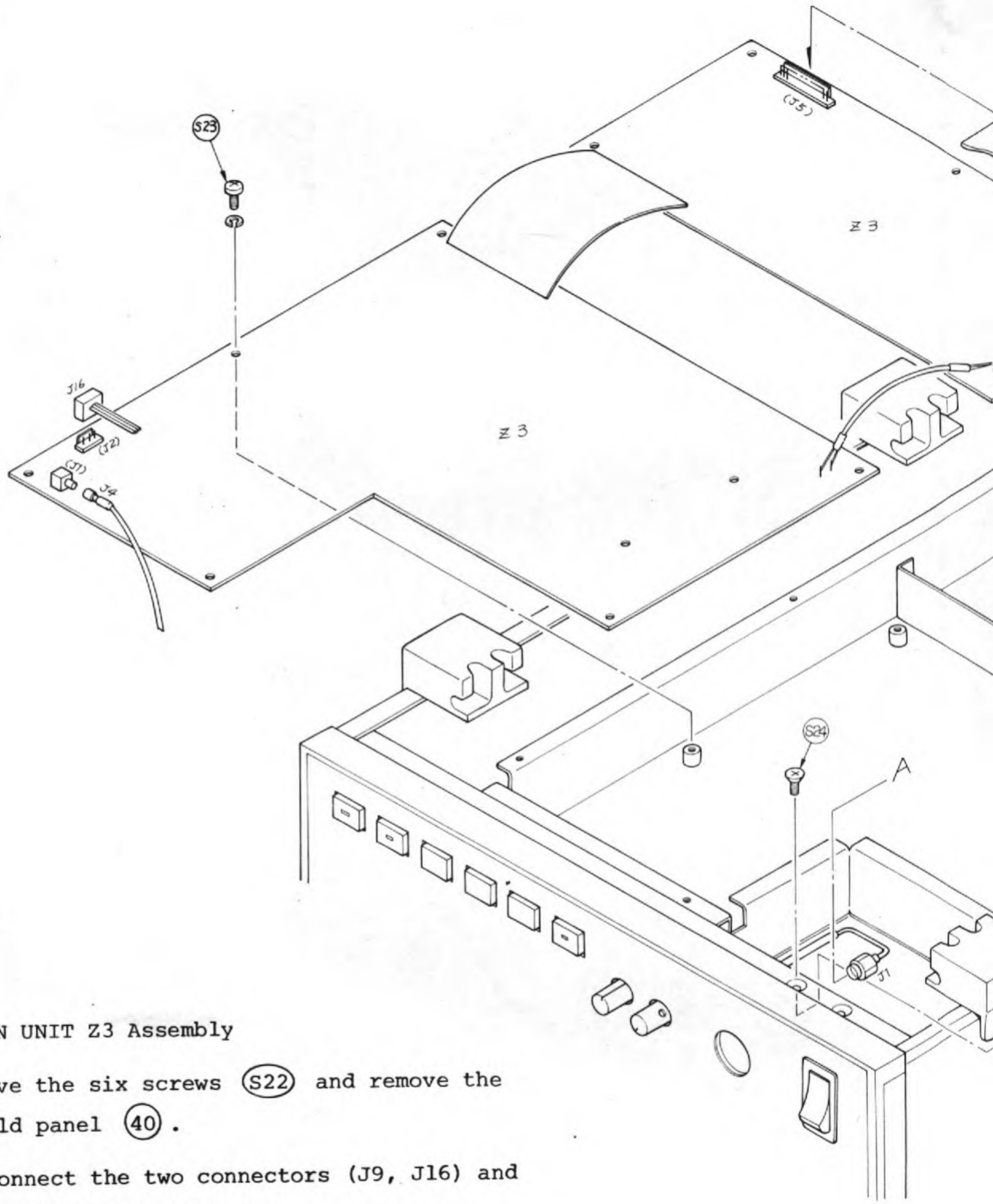


Fig. 2-9 RF UNIT Assembly
(continued)



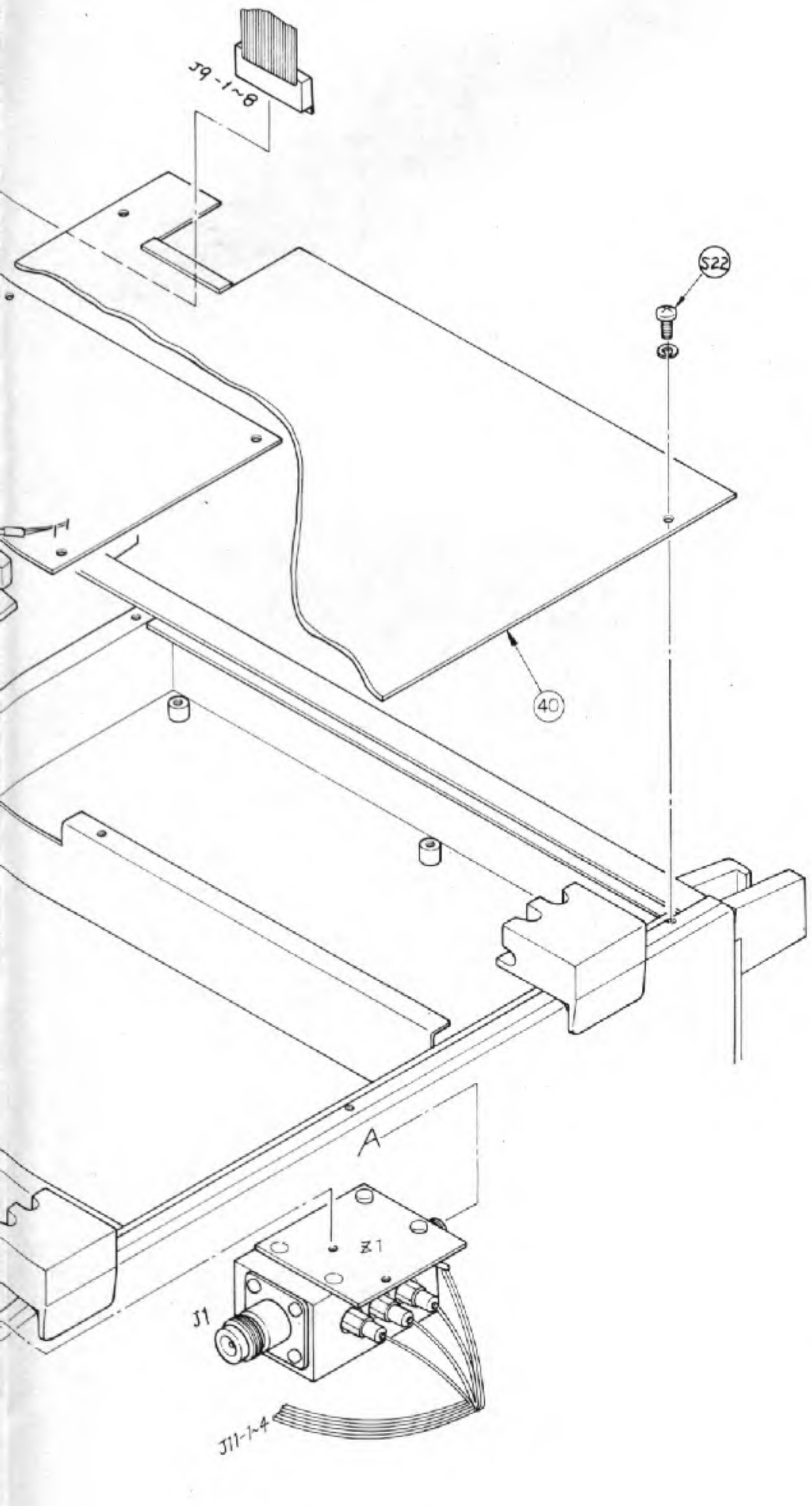
IF SECTION UNIT Z3 Assembly

(1) Remove the six screws (S22) and remove the shield panel (40).

(2) Disconnect the two connectors (J9, J16) and the coaxial connector J4.

(3) Remove the twelve screws (S23).

(4) Remove the IF section unit Z3.



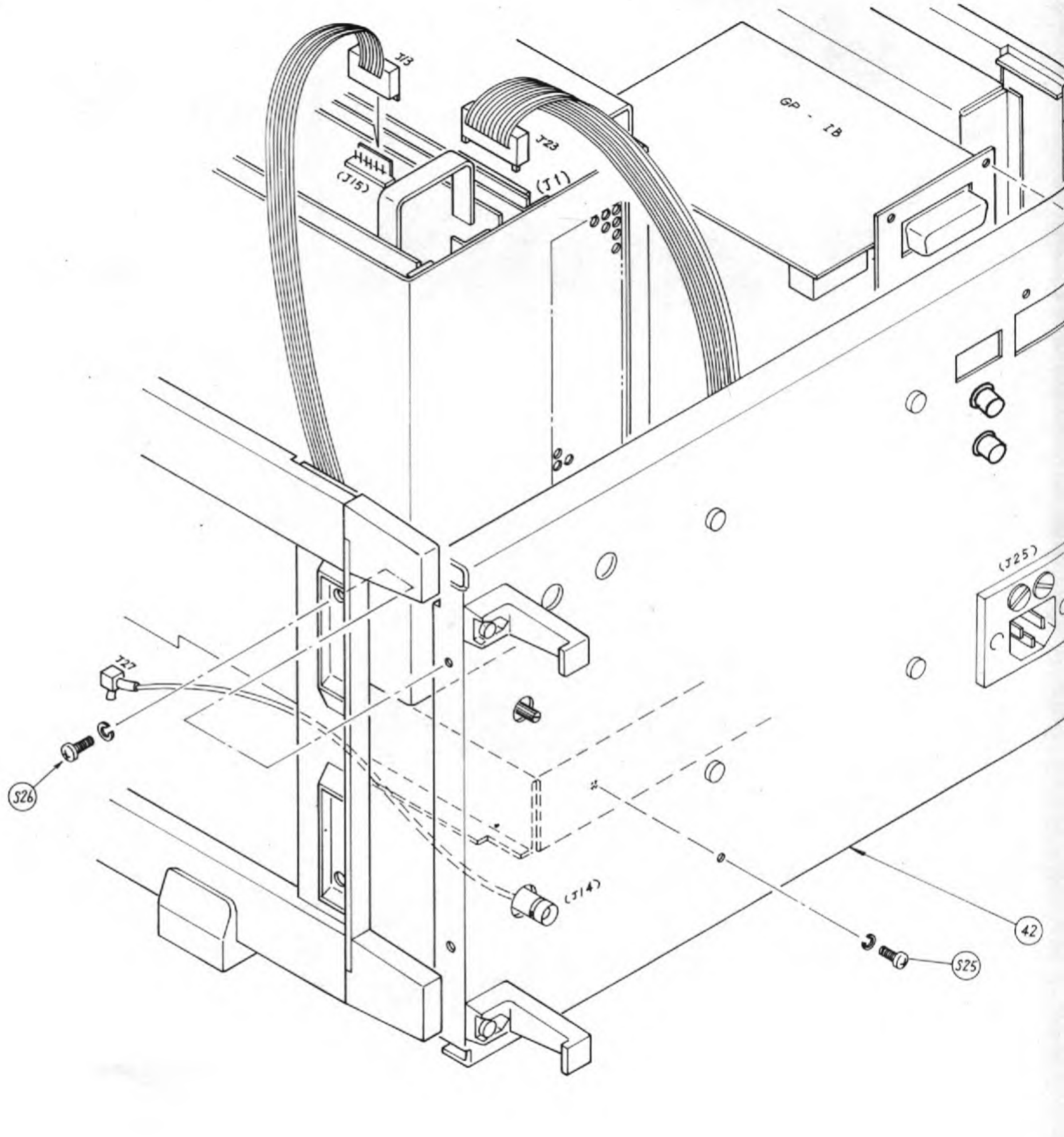
P-ATT UNIT Z1 Assembly

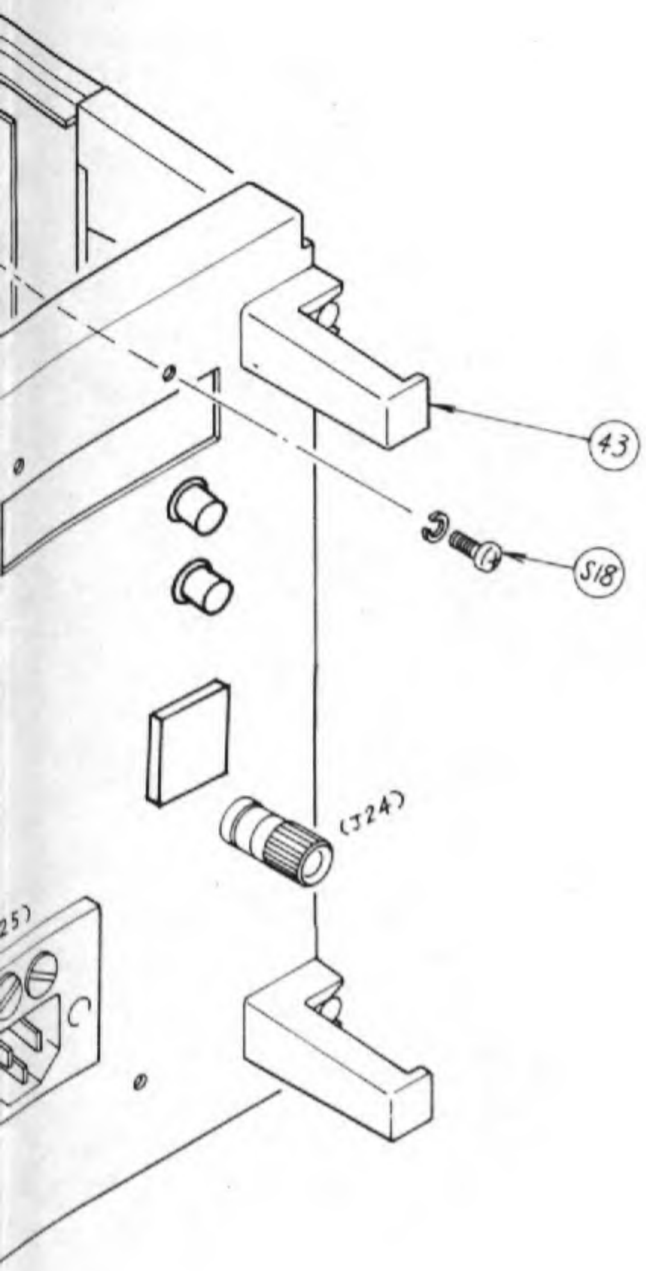
(1) Remove the two screws (S24).

(2) Disconnect connector J11 and the coaxial connector J1.

(3) Remove the P-ATT unit Z1.

Fig. 2-10 IF SECTION UNIT Z3 Assembly


J13
J23
(J15)
(J1)
GP - IB
(J25)
J27
S26
(J14)
42
S25



Rear Panel Assembly

(1) Remove the two screws (S18) and the GP-IB option.

(2) Remove the two screws (S25) and the four screws (S26).

(3) Remove the rear panel (42) and disconnect connectors J13, J23 and J27.

(4) Disconnect the inside terminal of ac power inlet J25.

(5) Remove the inside nut of J24 and the earth-tag.

Fig. 2-11 Rear Panel Assembly

2.2 Ac Line Power Supply Rating Changes

The MS610B/J/J1 has a power transformer with several taps so that nominal ac line voltages specified from 100 to 254 Vac can be used.

When changing to a different nominal ac line voltage, change the wiring on the appropriate primary taps of the power transformer according to Fig. 2-12.

(Refer to the circuit diagram **24** in Section 4.)

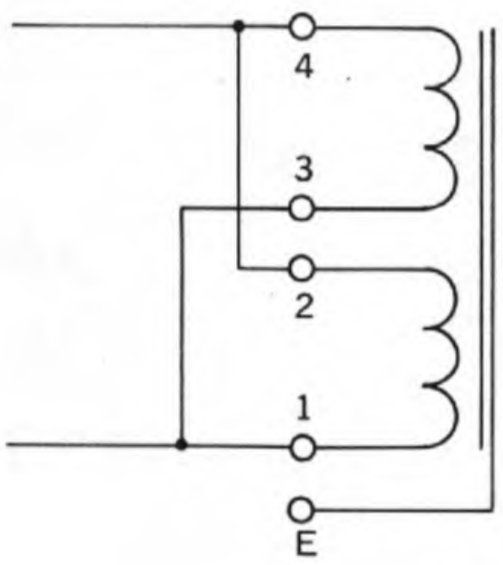
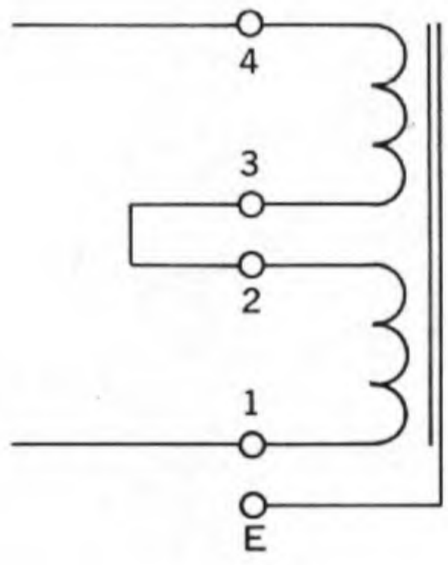
Nominal 100 V System	Nominal 200 V System
	
Nominal ac line voltages: 100 to 127 V	Nominal ac line voltages: 200 to 254 V

Fig. 2-12 Ac Line Power Supply Rating Change

SECTION 3

CIRCUIT DESCRIPTION

3.1 Introduction

The MS610B/J/J1 is a superheterodyne type scanning spectrum analyzer.

The block diagram is shown in Fig. 3-1.

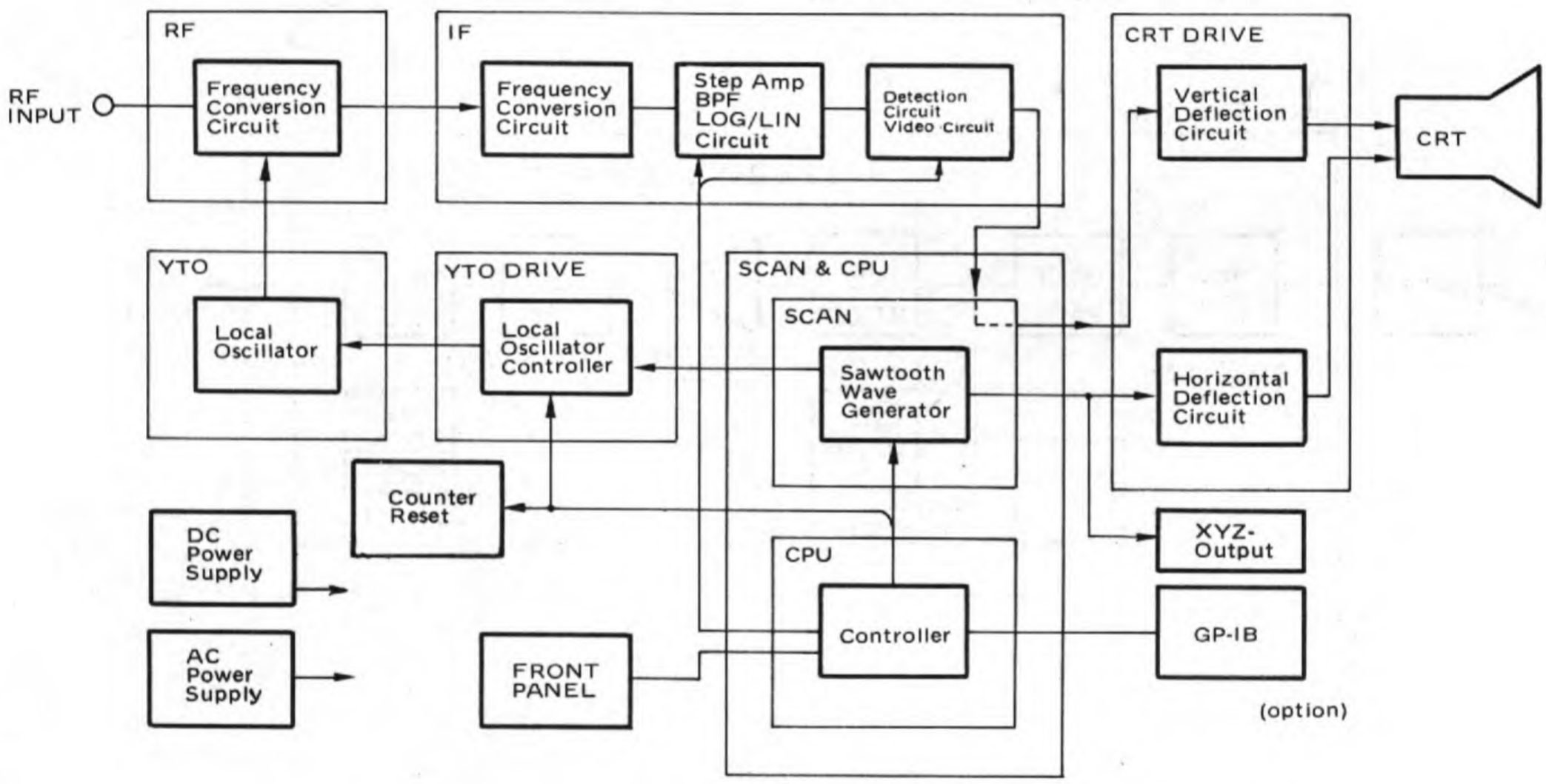


Fig. 3-1 MS610B/J/J1 Block Diagram

The RF input signal is converted to an IF signal by the frequency conversion circuit mixer in RF and IF Sections. This IF signal is detected and is applied to the CRT vertical deflection plate. The sweep signal is generated by a sawtooth wave generator and is applied to the CRT horizontal deflection plate. This sweep signal simultaneously sweeps the local oscillator, and frequency sweep corresponding to the CRT horizontal axis is performed. A controller controls each section using a microcomputer.

3.2 RF Section

After the RF input signal passes through the P-ATT (Programmable Attenuator), 0 to 2 GHz LPF and 6 dB PAD, it is sent to the Frequency Conversion Circuit. The input signal is converted to a 21.4 MHz IF signal after double frequency conversion as shown in Fig. 3-2. After the input signal is beat up to 2.5214 GHz to prevent image response, it is converted to 21.4 MHz.

The CAL signal is generated by the 50 MHz OSC.

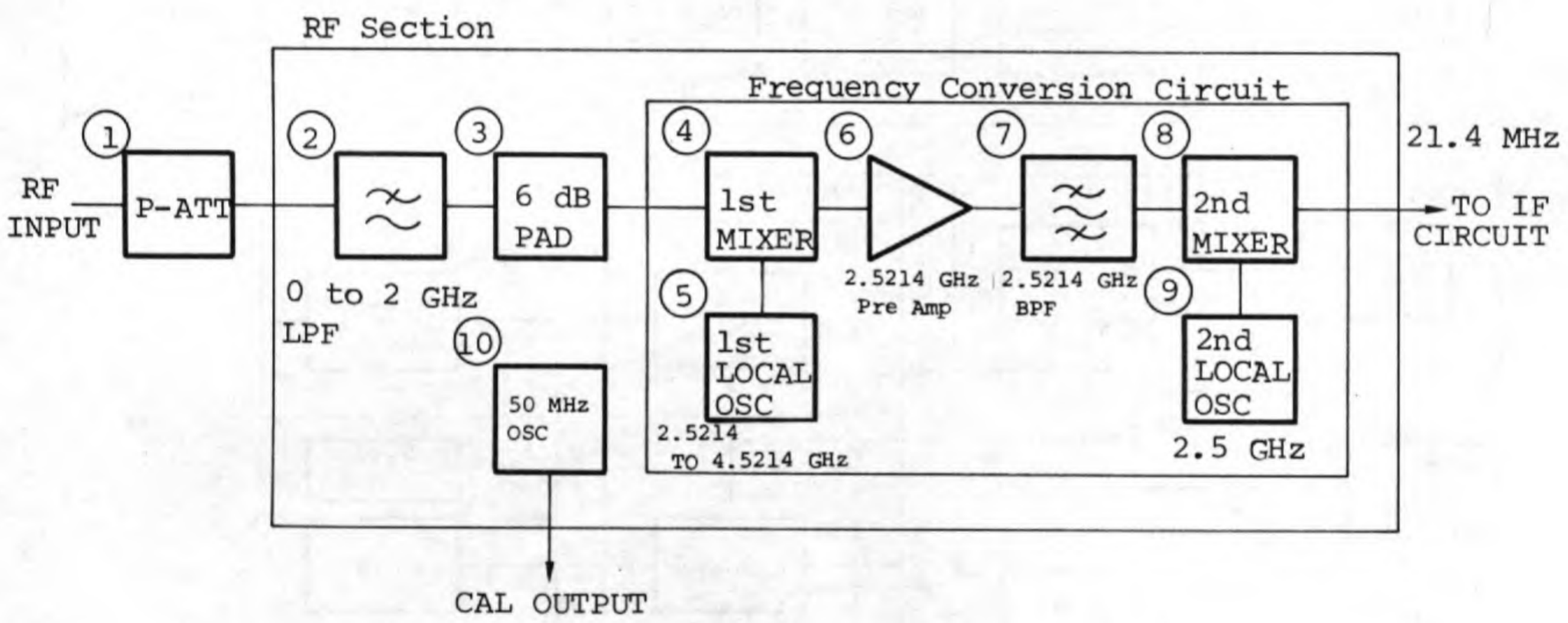


Fig. 3-2

The P-ATT is exposed in a front corner when the bottom cover is removed.

A diecast case, which includes the RF section, is exposed on the right side when the top and right side covers are removed.

The layout of the RF Section in the diecast case is shown in Fig. 3-3. The numbers in Fig. 3-3 correspond to the numbers in Fig. 3-2.

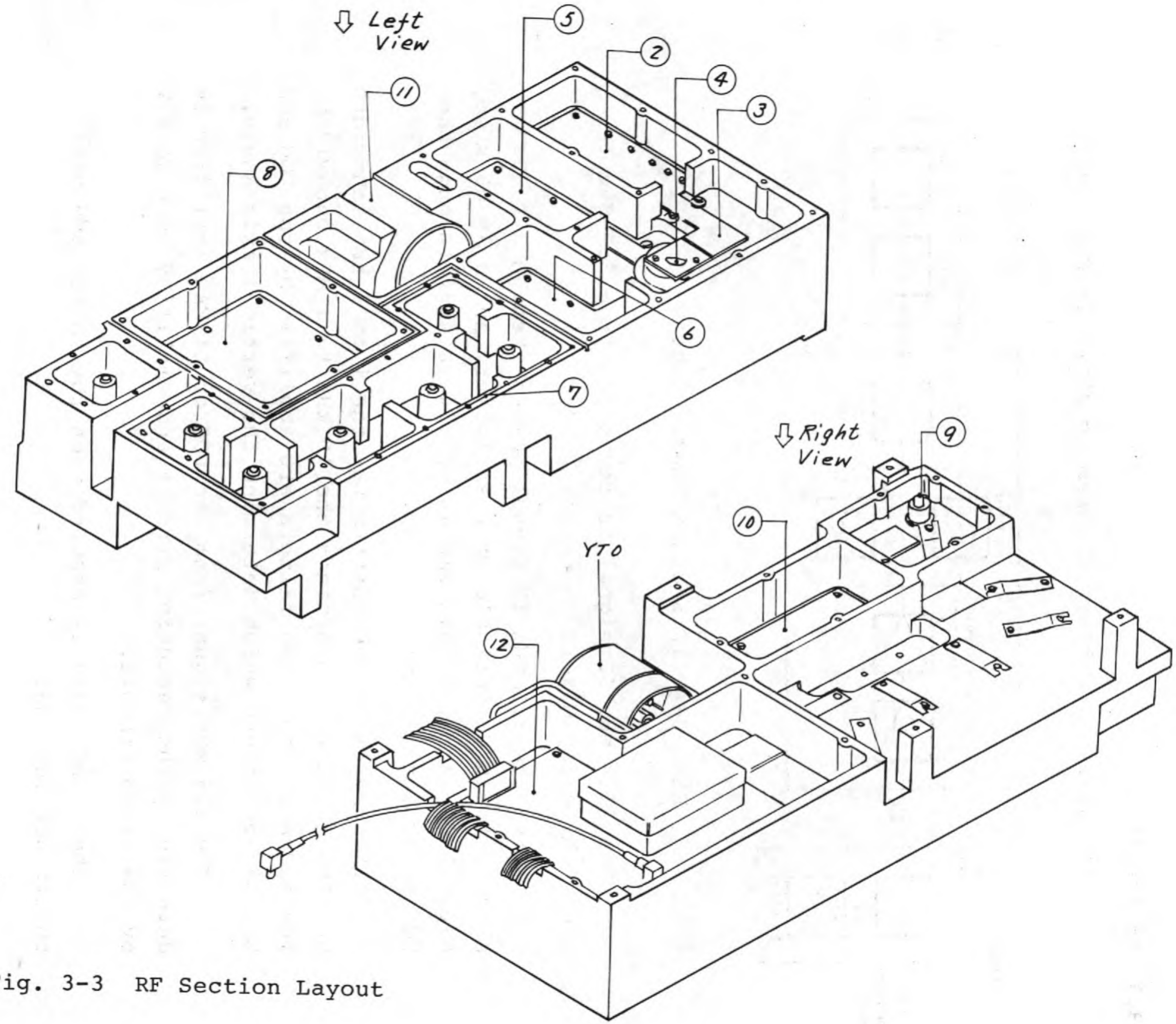


Fig. 3-3 RF Section Layout

3.3 IF Section

The IF SECTION block diagram is shown in Fig. 3-4.

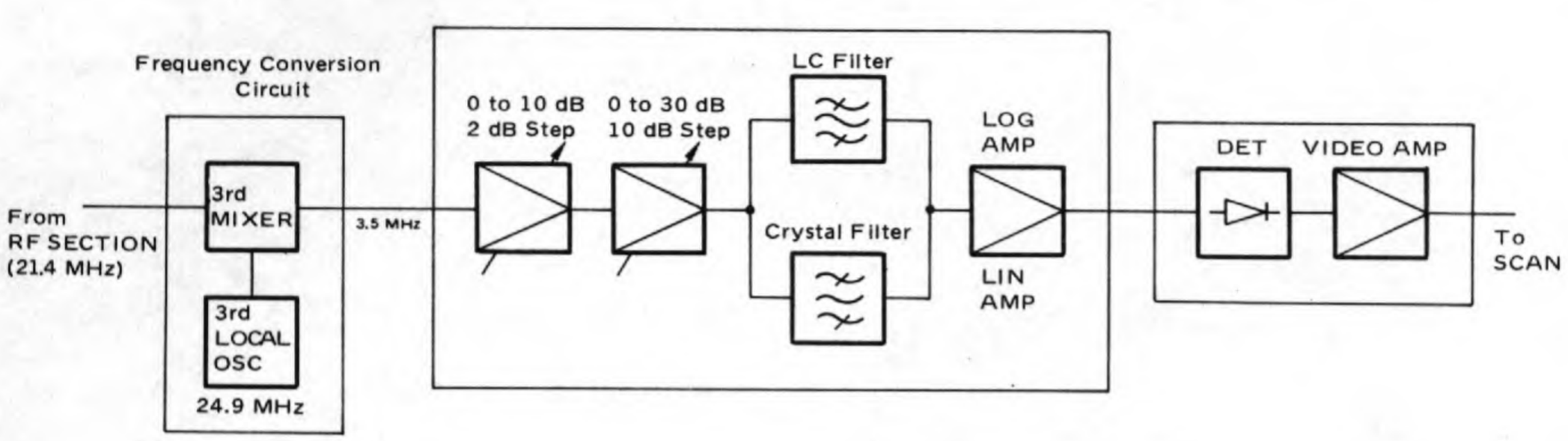


Fig. 3-4 IF Section Block Diagram

The 21.4 MHz IF signal is converted to a 3.5 MHz IF signal by a 3rd Mixer.

After the 3.5 MHz IF signal passes through a 2 dB step, 0 to 10 dB variable gain amplifier, and a 10 dB step, 0 to 30 dB variable gain amplifier, it is sent through the LC and crystal filters.

The crystal filter determines the 1 to 3 kHz bandwidth and the LC filter determines the 10 kHz to 1 MHz bandwidth. The signals from these filters are amplified by the LOG and LINEAR amplifiers which determine the vertical axis scale.

The 3.5 MHz signal from the LOG or LINEAR amplifier is detected by the detection circuit and amplified to 0 to 4 V by the video circuit.

The IF PC board is exposed when the bottom and next covers are removed.

3.4 Scan & CPU Sections

(1) Scan section

The Scan section block diagram is shown in Fig. 3-5.

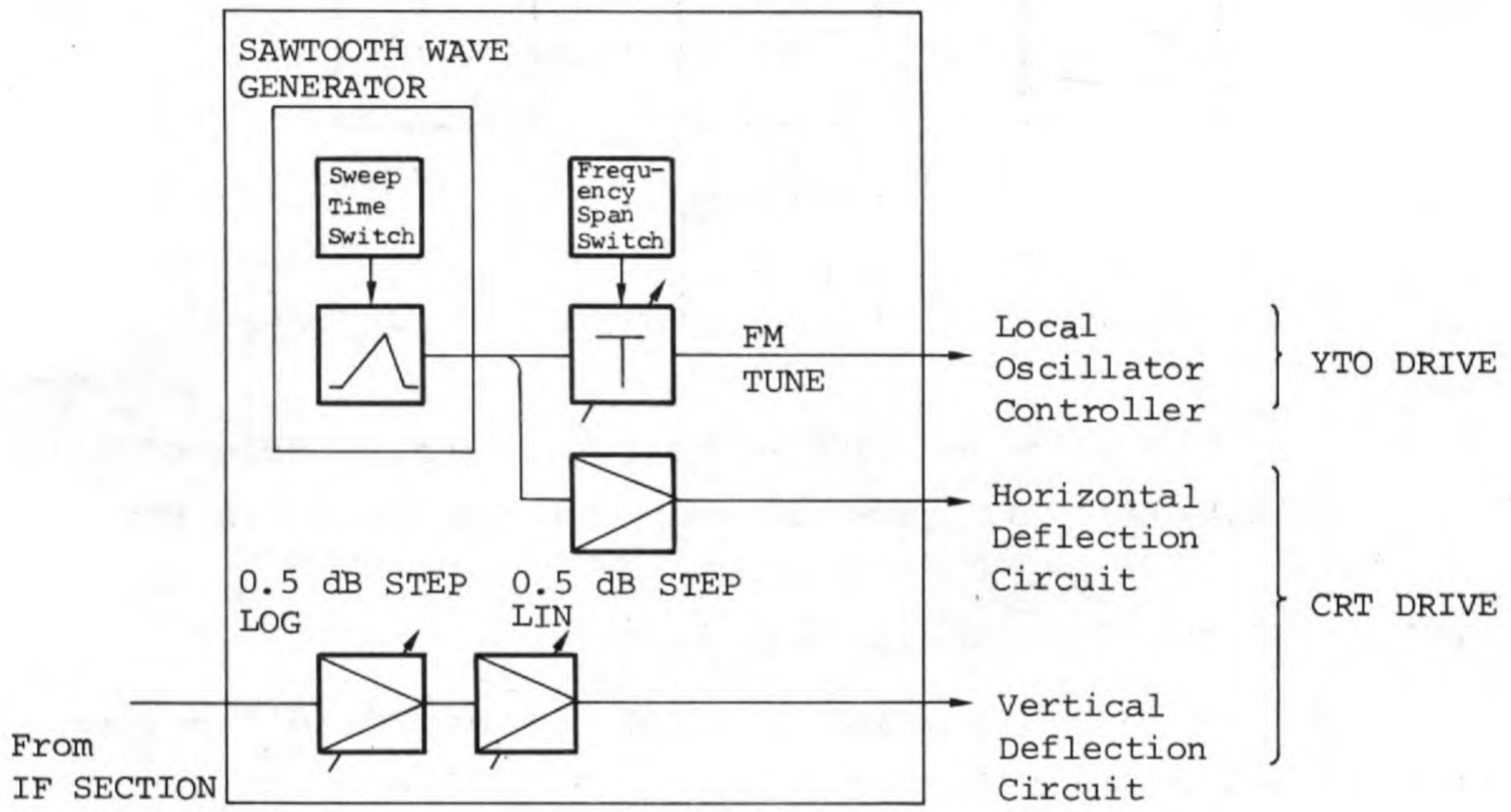


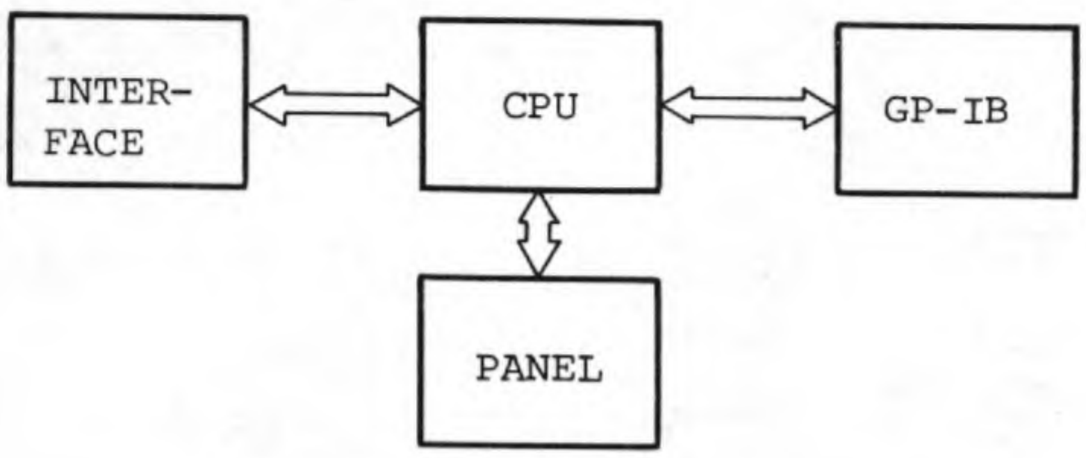
Fig. 3-5 Scan Section Block Diagram

The sweep time is determined by the SWEEP TIME switch; the sawtooth wave signal sweeps the 1st local oscillator through the FREQ SPAN switch that controls the FREQ SPAN. The SWEEP TIME switch and FREQ SPAN switch are controlled by the controller. The sawtooth wave signal also sweeps the CRT horizontal axis.

After the detected signal from the IF section passes through a 0.5 dB step Log amplifier and a 0.5 dB step Linear amplifier, it is sent to the vertical deflection circuit in the CRT DRIVE section.

(2) CPU section

The MS610B/J/J1 uses a CPU controller. Each circuit is controlled via an interface circuit for panel key inputs. GP-IB control is also performed.



The scan and CPU PC boards in the middle of the MS610B/J/J1 are exposed when the top cover is removed.

3.5 YTO DRIVE and YTO (Local Oscillator)

The YTO DRIVE section consists of an FM coil driver and a TUNE coil driver as shown in Fig. 3-6.

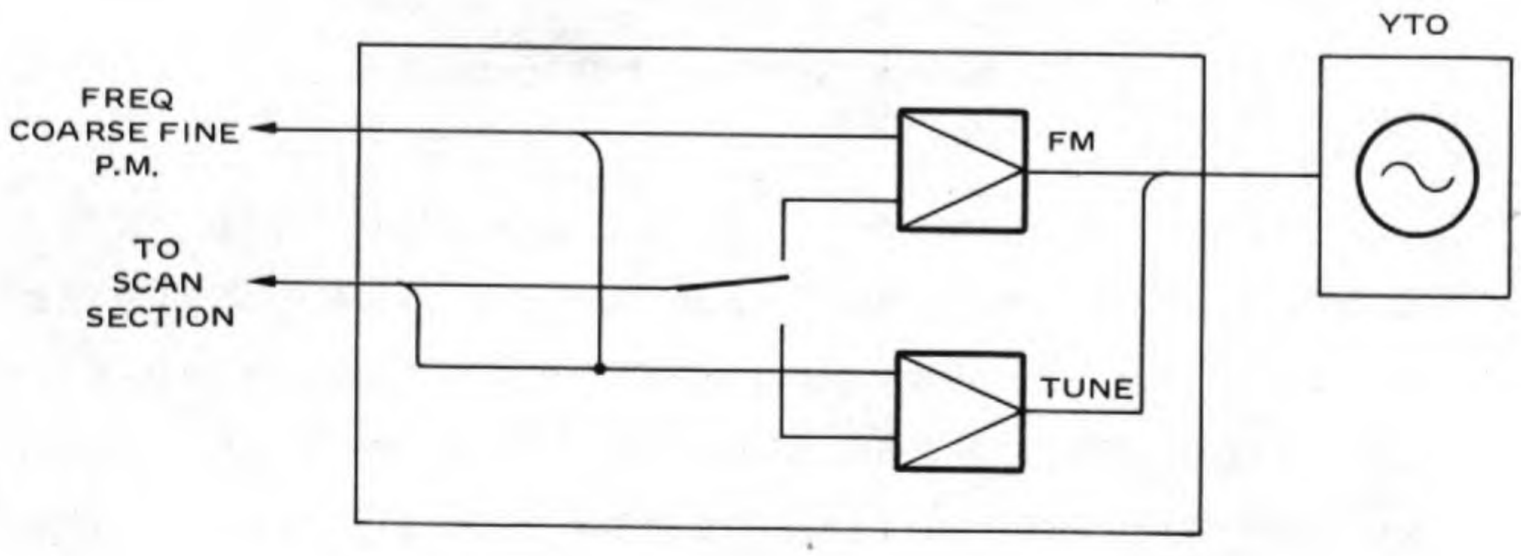


Fig. 3-6 YTO DRIVE Block Diagram

The YTO (1st Local Oscillator) contains tuning and FM coils that are driven by current.

A YTO tuned coil is used in the 5 MHz to 2 GHz wide-band sweep and a YTO FM coil is used in the 100 kHz to 2 MHz narrow-band sweep.

The YTO and YTO driver are mounted in the diecast case as shown in Fig. 3-3.

3.6 CRT DRIVE

The CRT DRIVE section receives X-, Y-, Z-axis (Blanking) and marker pulse signals from the Scan section, and intensity-controlling signal. These signals are converted to the high voltages which drive the CRT.

The PC board can be seen by removing left and protection covers.

Be careful of the high voltage.

3.7 Power Supply and Front Panel

(1) Power supply

The Power Supply section produces the dc power supply (±15 V, ±12 V, +5 V).

The angle (hatched) with the power supply PC board is exposed in the middle when the top cover is removed. (See Fig. 5-2.)

(2) Front panel

The front panel section drives all LEDs under control of the CPU and sends the status of front panel keys to the CPU.

The front panel PC boards are installed in front behind the displays and keys.

SECTION 4

CIRCUIT DIAGRAMS

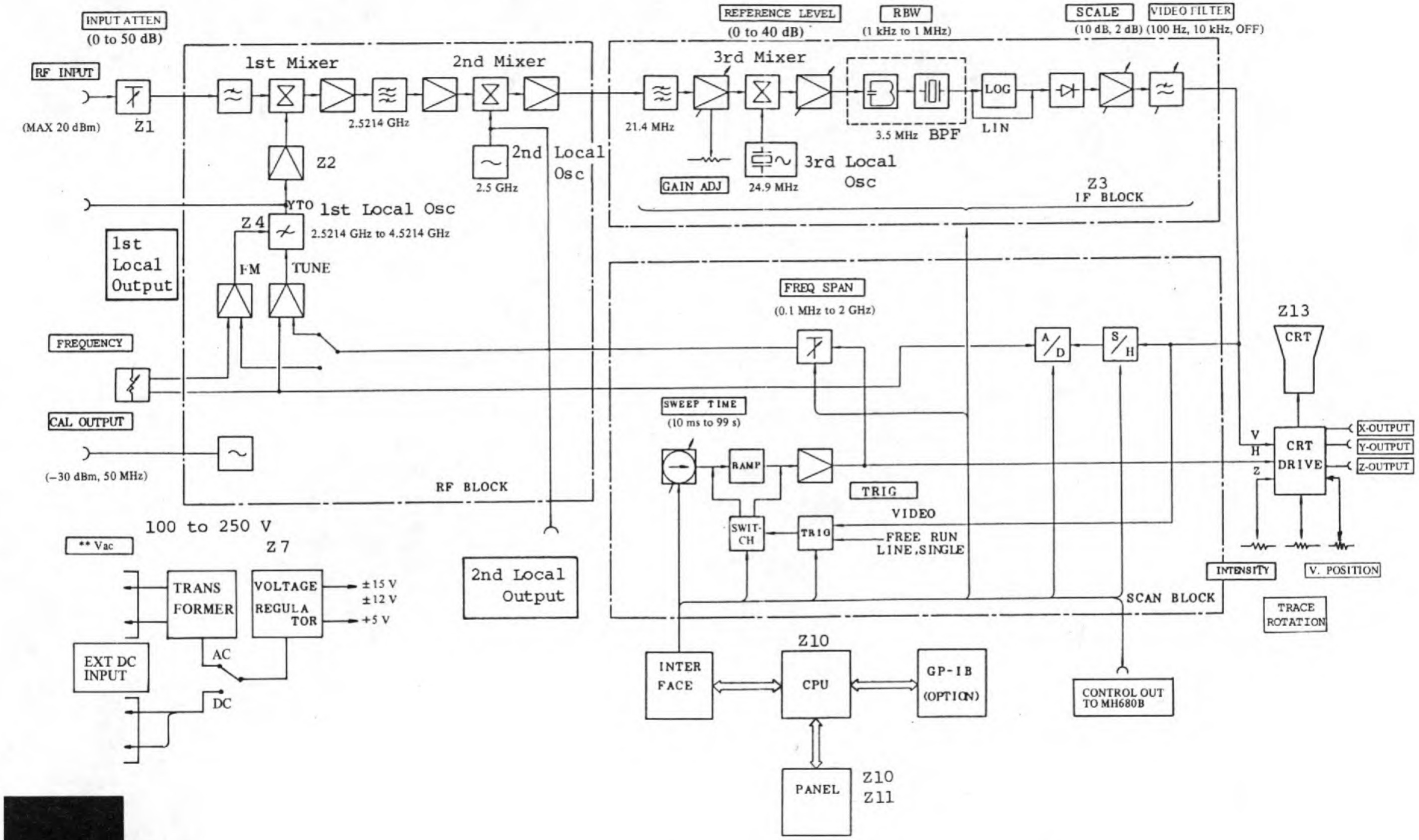
Table 4-1 lists the names of all PC boards. It also gives the circuit diagram numbers.

Table 4-1 Circuit Diagrams and PC Boards

Circuit Diagram No.	Z No.	Name	PC Board No.
1		MS610B/J/J1 Block Diagram	———
2		MS610B/J/J1 Circuit Diagram	———
3		FRONT PANEL (1) (2) Block Diagram	———
4	Z11	FRONT PANEL (1) Circuit Diagram	332U25794
5	Z11	FRONT PANEL (2) Circuit Diagram	332U25792
6		IF Block Diagram	———
7	Z3	IF Circuit Diagram	322U10018 (or 322U9289)
8		SCAN (Scan & CPU) Block Diagram	———
9		CPU (Scan & CPU) Block Diagram	———
10	Z9 & Z10	SCAN & CPU Circuit Diagram	322U9261
11		CRT DRIVE Block Diagram	———
12	Z12	CRT DRIVE Circuit Diagram	332U25790

Table 4-1 (Continued)

Circuit Diagram No.	Z No.	Name	PC Board No.
13		YTO DRIVE Block Diagram	———
14	Z5	YTO DRIVE Circuit Diagram	332U25796
15		RF CONVERTER Block Diagram	———
16	Z2	RF CONVERTER Circuit Diagram	———
17		2nd. CONVERTER Circuit Diagram	332U25775
18		50 MHz OSC Circuit Diagram	342U84163
19		2.5214 GHz PRE AMP Circuit Diagram	332U25772
20		2.5 to 4.5 GHz LO AMP Circuit Diagram	332U27955
21		6 dB PAD Circuit Diagram	342U84146
22	Z14	DIGITAL SW Circuit Diagram	342U84816
23		POWER SUPPLY Block Diagram	———
24	Z7	POWER SUPPLY Circuit Diagram	(No number)
25	Z17	XYZ OUTPUT Circuit Diagram	342U88434
26	Z16	GP-IB Circuit Diagram	332U25798

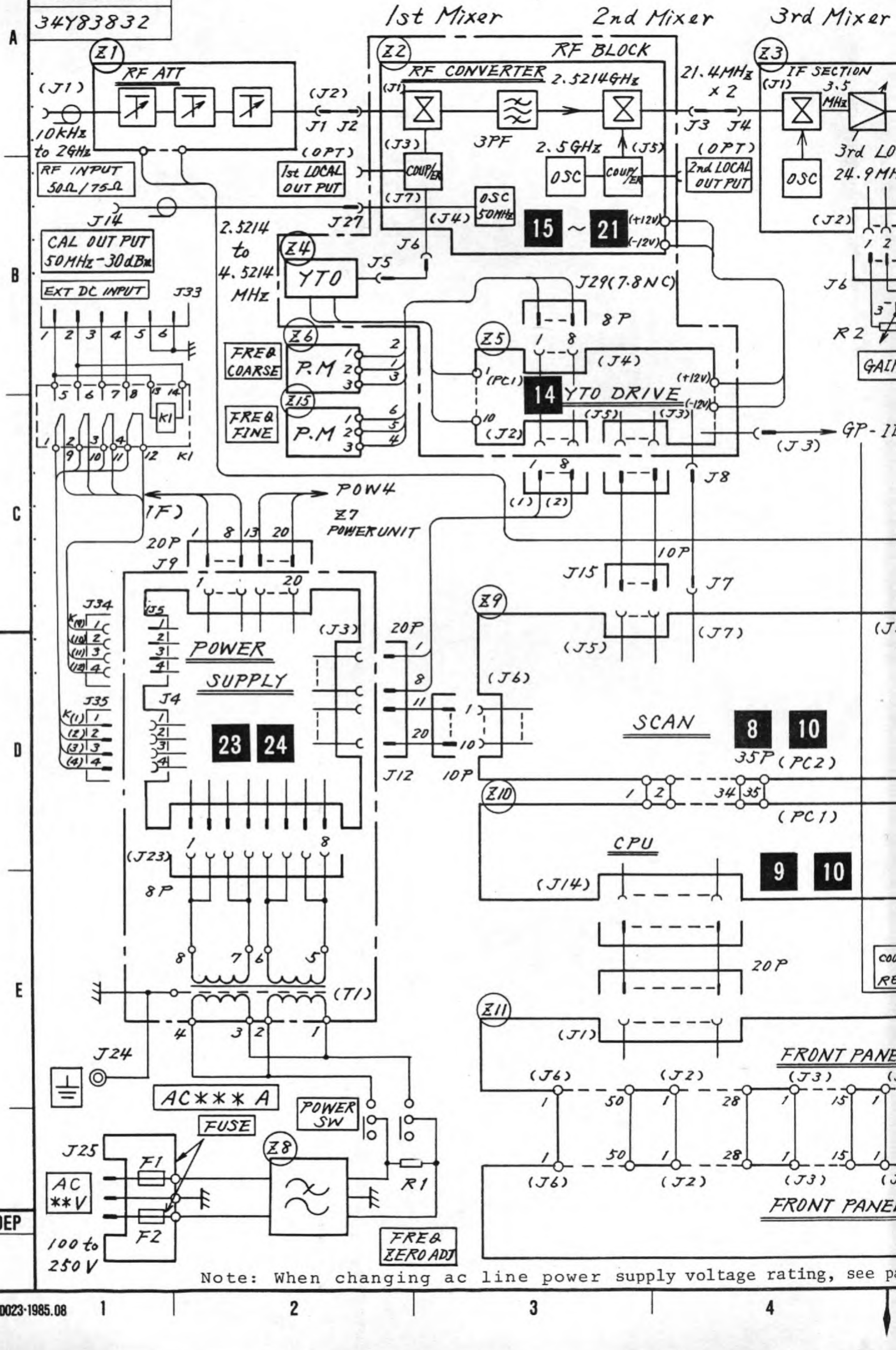


MS610B/J/J1 Block Diagram

33W28091 1/1

APPLICATION

34Y83832



Note: When changing ac line power supply voltage rating, see p

5 6 7 8

REVISIONS

A

xer

ON 3.5MHz BPF

LOG

LOCAL OSC

(PC1) 1 20

.9MHz 7 6

(J3)

(PC2)

J5

1 2 3

3P

X-OUT PUT J30

Y-OUT PUT J31

Z-OUT PUT J32

1 10

(1) (10) 10P

POW3

3 2 1

GAINADJ

J28

Z17

(J2)

25

XYZ-OUTPUT

(J1)

J37

J36

P-IB 1

(J3) (J17) (J1)

J11 15P

1 4 6 15

10

(J5) (J2)

10P

(TO Z7 POWER SUPPLY)

8P 1 8

POW4 (13) (20)

(J2)

40P

(J13)

(J16) (J15)

J18

COUNTER RESET J10

J13 5P

GP-IB 1

Z13

CRT

(P2)
(P1)
(G2)
(G1)
K
H

11 13 9 7 6 4 12 3 2 1 14

J20

15P J21

Z12

14 15 12 13 11 5 10 7 3 2 1

J22 3P

(J3)

(J1)

(J4)

CRT DRIVE

11 12

1 2 3

J19 3P

TRACE ROTATION

VERTICAL POSITION

R3

3 2 1

INTENSITY

Z14 Digital Switch

22

(J1)

REF LEVEL

(J2)

GP-IB (OPT)

26

(J1)

ADDRESS SW

GP-IB

B

C

D

E

F

3 5

PANEL(2)

(J4) (J5)

1 6 1 10

1 6 1 10

(J4) (J5)

PANEL(1)

3 4

ee paragraph 2.2.

Parts List	34W89577

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

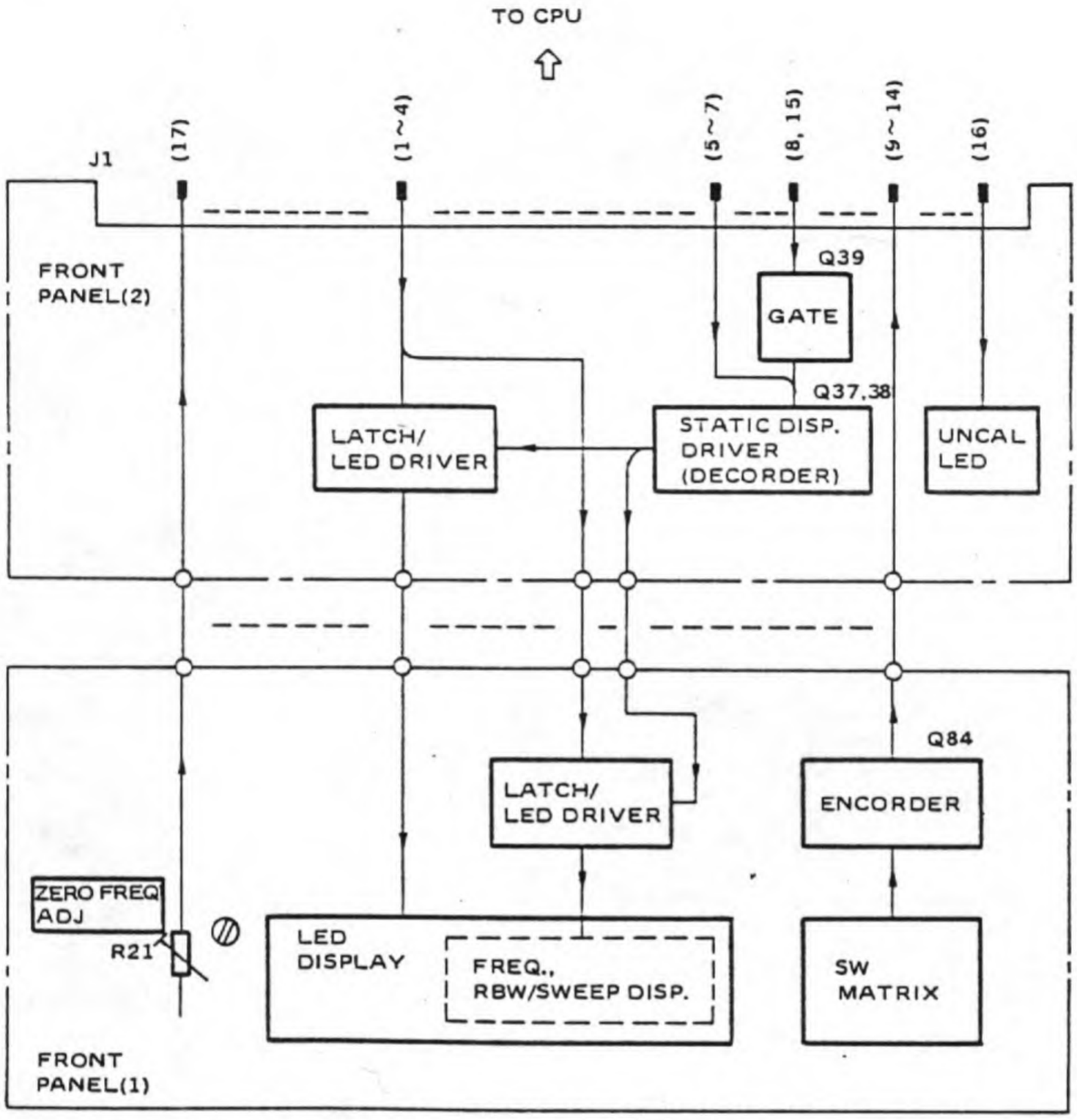
2

CHECKED BY	TRACED BY	SCALE
APPROVED BY	DRAWN BY	:

TITLE MS610 B/J/J1 SPECTRUM ANALYZER CIRCUIT DIAGRAM

DRAWING No. 33W.28091 1/1

5 6 ANRITSU CORP. 4-5/4-6



FRONT PANEL
Block Diagram

APPLICATION

34Y83839

R3 ~ R6
AHR-7-561JB

Q27. 28. 35. 36
TC4511BP

R13. R14
AHR-7-122JB

FREQUENCY

Q1
LN524GK

(LED)

a b c d e f g

Q3
LN524GK

(LED)

a b c d e f g

RBW/SWEEP

Q11
LN513GK

dp
a b c d e f g

R3 R4 R5 R6

Q27 Q28

LE BI A B C D LT

BI LT A B C D LE

J6-36 J6-37 J6-38

(PA 10) (PA 11) (PA 12) (PA 13)

+5V

② to FRONT(2)

J6

R21 2k

R20 330

+5V

Q74 RD2.7EB

C23 0.1

+5V

(PA 10)
(PA 13)
(PA 11)
(PA 12)

Q5
LN513GK

SPAN/ATT

⑤ to FRONT(2)

Q27-5
Q28-5
Q35-5
Q36-5
TEN1
TEN2
TEN3
TEN4
TEN5

Q41 Q43 Q45 Q47 Q49 Q51 Q53 Q55 Q57 Q59 Q85 Q63 Q65 Q67

Q40 Q42 Q44 Q46 Q48 Q50 Q52 Q54 Q56 Q58 Q60 Q62 Q64 Q66

(S) (MHz)-RBW (RBW/SWEEP) (REF/MARKER) (dBμ) (GHz)-SPAN (dB) (ms) (MHz)-SPAN (SPAN/ATT) (dBm) (dBW/m) (0) (KHz)-RBW (LINEAR) (QP) (10dB/div) (EPFF RUN) (10KHz) (LINE) (2dB/div) (SINGLE) (STARTFREQ) (SWEEP TIME) (REFLEVEL) (INPUT ATT) (MARKERLEVEL) (CENTER FREQ)

+5V

Q24 15. 16. 17. 18. 19.

Q40. 41, 45. 46. 48. 51. 52. LT9200N
Q44, 47, 50. 53 LT9002N
Q42, 43, 49. TLY226

Q54 ~ 60. 85 ~
Q62 ~ 72

DEP

No. 0021-1985.08

33W26566 1/2

REVISIONS

2JB

REF/MARKER LEVEL

Q12 LN513GK
Q7 LN513GK
Q8 LN513GK
Q9 LN513GK
Q10 LN513GK
R22 1.2k
+5V
R14
Q36
BI LT A B C D LE
J6-39
(PA10) (PA11) (PA12) (PA13)
Q6 LN513GA
(1) to FRONT(2)
(3) to FRONT(2)
(4) to FRONT(2)
Q84-13 (INT5)
Q67 Q68 Q69 Q70 Q71 Q72 Q86 Q87 Q88
(MARKER LEVEL) (CENTER FREQ) (REMOTE) (CPD to REF) (CPD to SPAN) (FREQ SPAN) (RBW) (100Hz) (VIDEO) (OFF)
, 85~88 TLG226
HL20-LSYG.

Parts List 34W85992

332U25794

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FIN

CHECKED BY	TRACED BY	SCALE	4
APPROVED BY	DRAWN BY	:	

TITLE: FRONT(1) Circuit Diagram

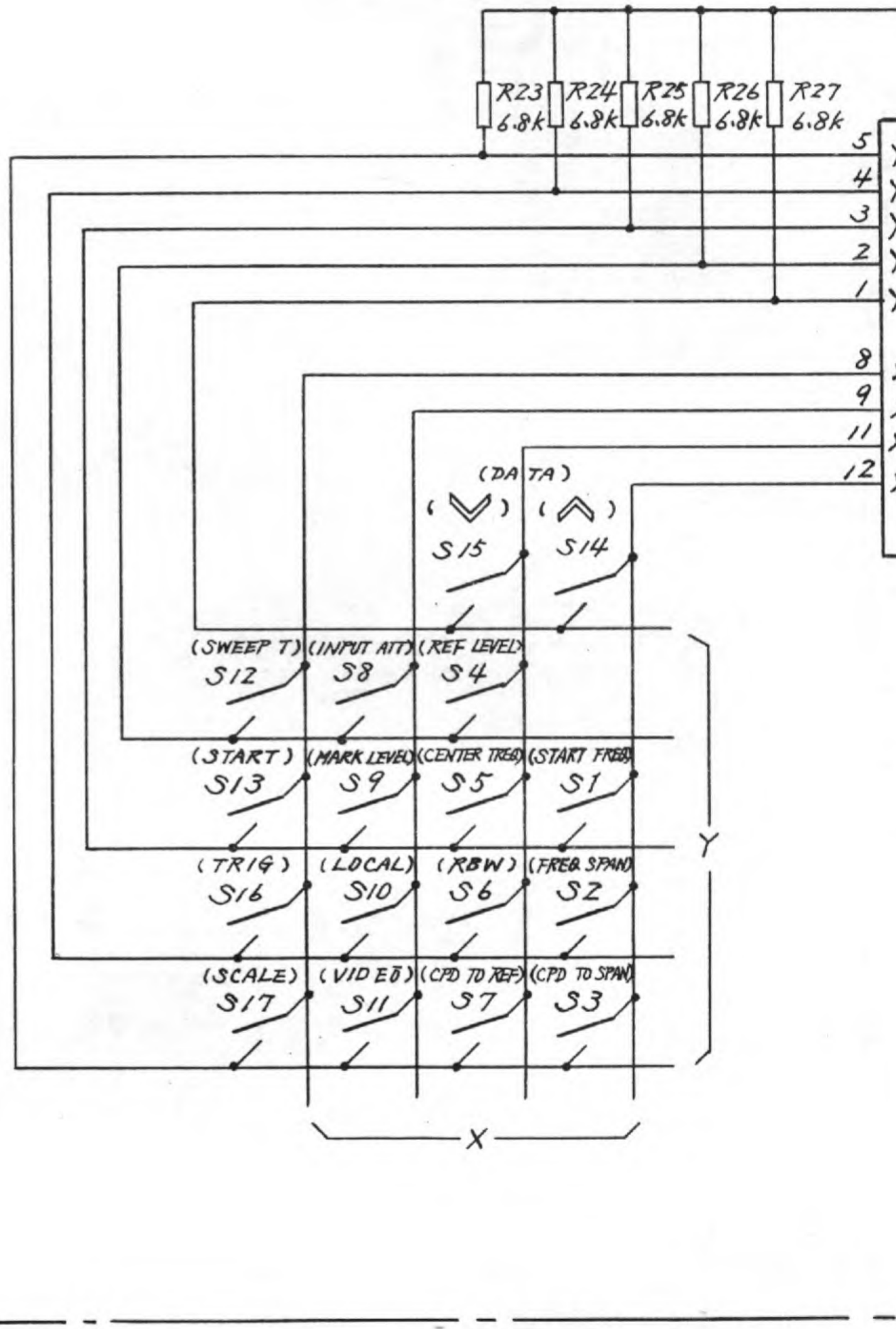
DRAWING No. 33W26566 1/2

ANRITSU CORP. 4-9/4-10

33W26566 2/2

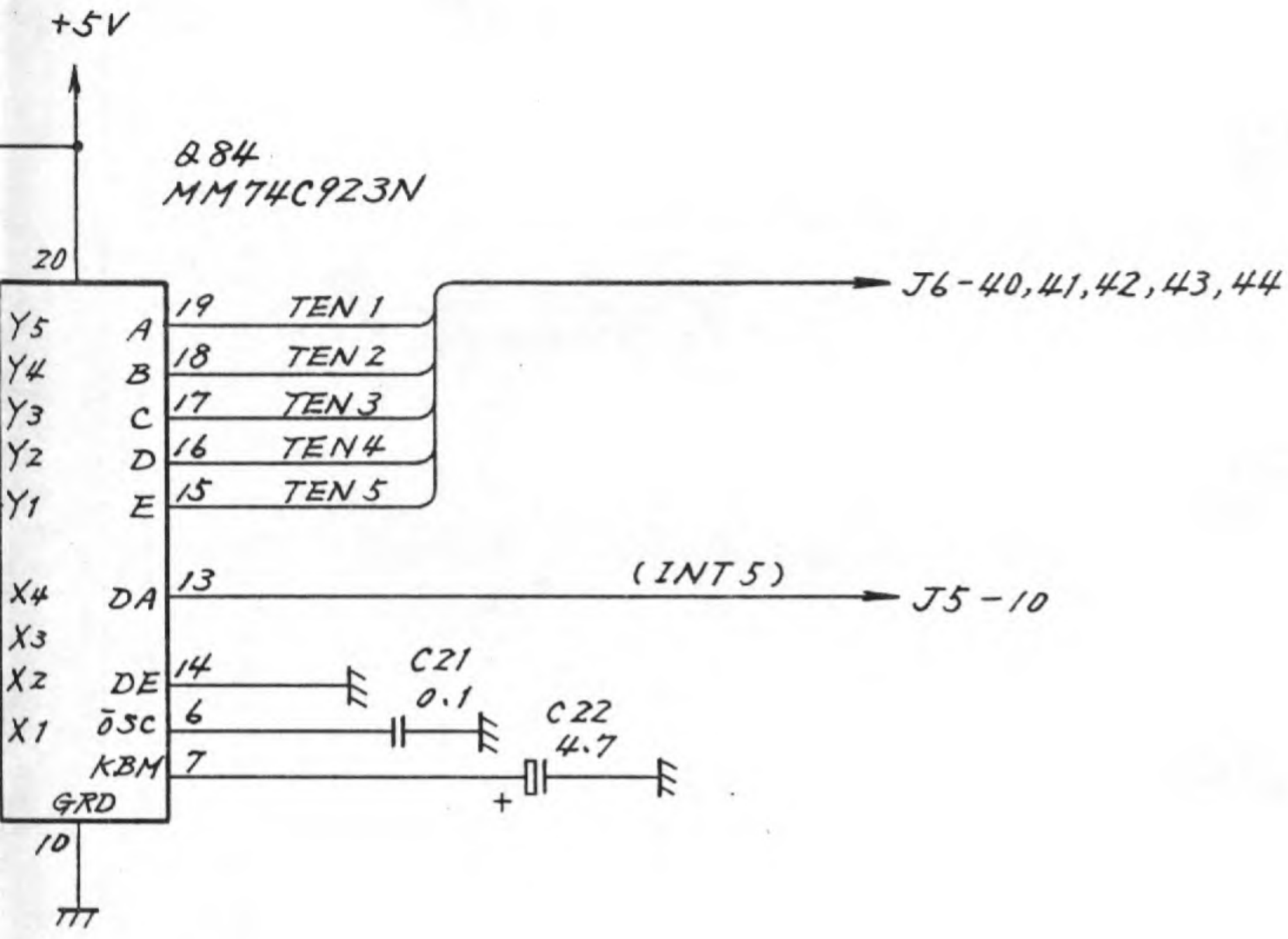
APPLICATION

34Y83839



DEP

REVISIONS



QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	4
APPROVED BY	DRAWN BY	:	

TITLE: FRONT(1) Circuit Diagram

DRAWING No. 33W26566 2/2

ANRITSU CORP.

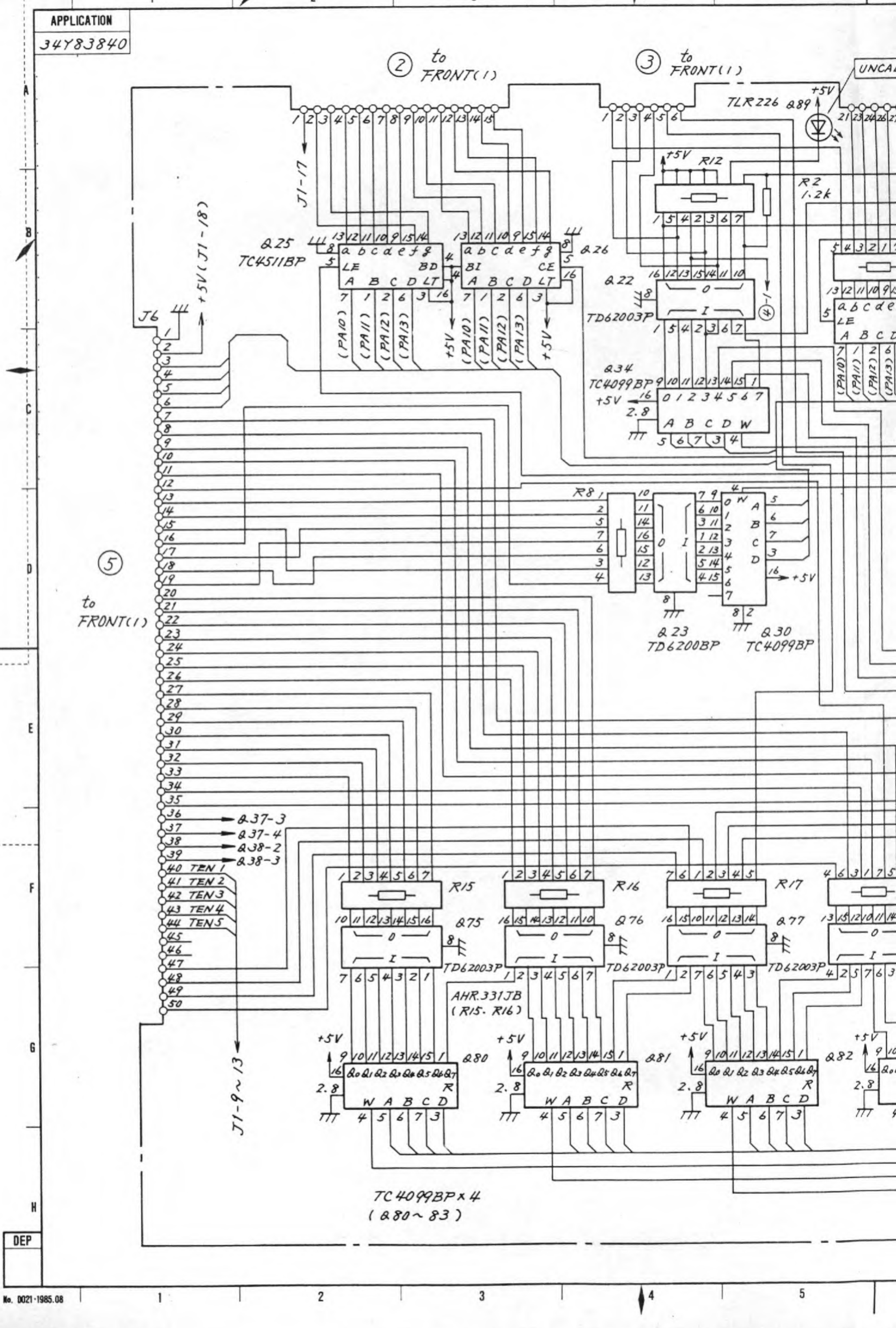
4-11/4-12

APPLICATION

34Y83840

DEP

No. D021-1985.08



33W26563 1/1

REVISIONS

UNCAL

(1) to FRONT(1)

R7 R9 R10 R11

AHR 122 JB (R7~12) ×6

Q33 TC4511BP ×7 (Q25.26.29 Q31~33)

Q29 Q31 Q32

Q38 TC40H042P

Q37 TC40H042P

Q39 TC4011BP

(N.C) +5V

J6-36 J6-37 J6-38 J6-39

J1 to CPU

(PA10)1 (PA11)2 (PA12)3 (PA13)4 (PA14)5 (PA15)6 (PA16)7 (PA17)8 (TEN1)9 (TEN2)10 (TEN3)11 (TEN4)12 (TEN5)13 14 15 16 17 18 19 20

Q'39-14 ② - 1

C4 C3 C2 C1 0.1

C9 C8 C7 C6 C5 0.1

Q39-7

J6-40~44

Q22-13

AHR 561JB (R17~19)

R18 R19

Q78 Q79

TD62003P TD62003P

Q83

④ to FRONT(1)

332U25792

Parts List 34W85989

5

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FIN

CHECKED BY	TRACED BY	SCALE
APPROVED BY	DRAWN BY	:

TITLE: FRONT(2) Circuit Diagram

DRAWING No. 33W26563 1/1

ANRITSU CORP. 4-13/4-14

APPLICATION

3.5MHz IF BP

RBW(1k to 1MHz)

Z6

Z8

Z4

RBW210K

RBW<10K

CAL AMP 21.4MHz BPF

Z1

MIX

Z2

2dB STEP AMP

Z3

10dB STEP AMP

Z7

RZ

GAIN ADJUST

Z21

24.9MHz OSC

REFERENCE LEVEL (0 to 40dB)

CPU

VBW (100Hz, 10KHz, Off)

SCALE ADJ

DETECT OUT

J3-10

-5V

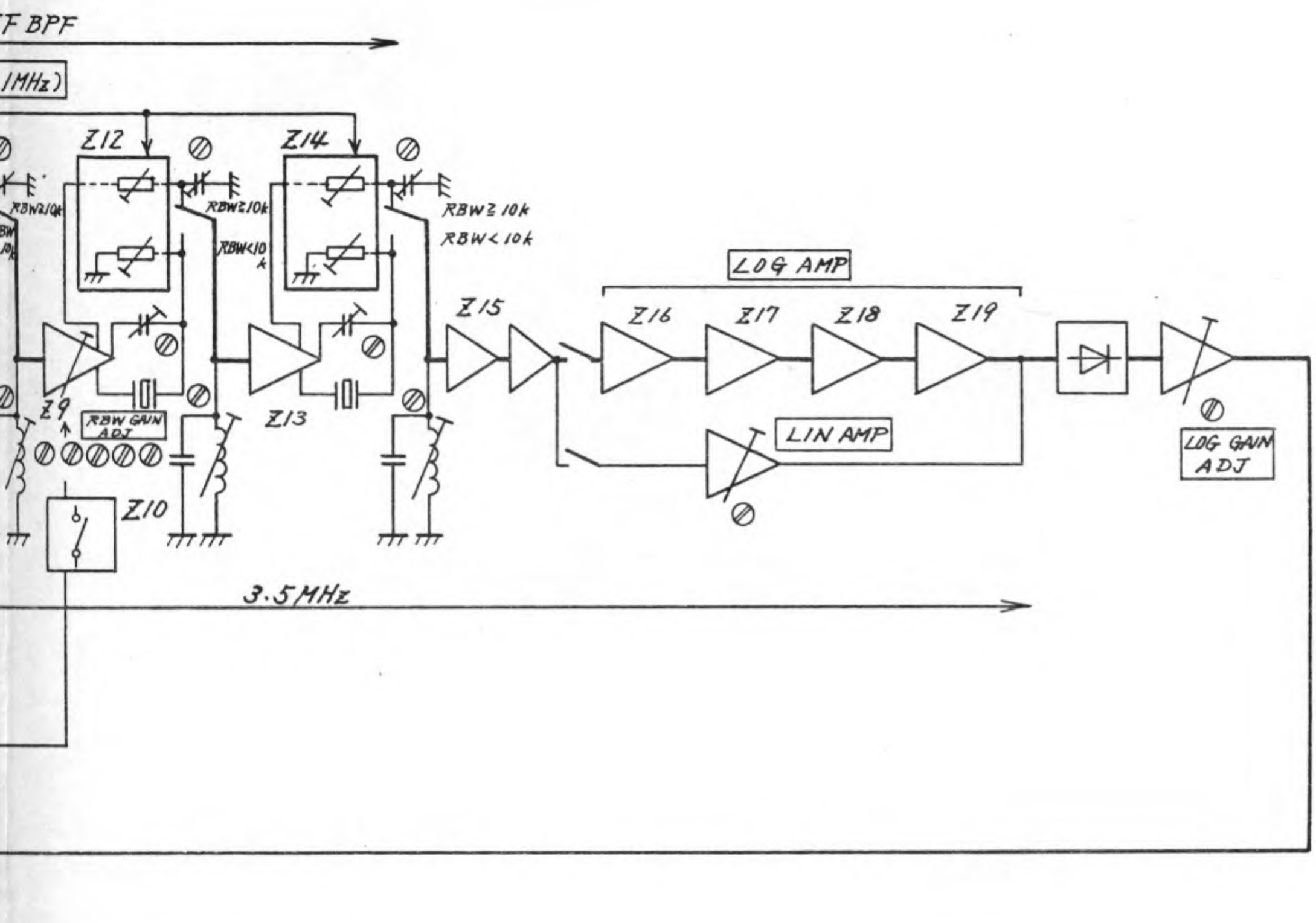
OFF SET ADJ

DEP

5 6 7 8

REVISIONS

A



B

C

D

E

6

F

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	NOTE

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

TITLE	DRAWING No.
IF Block	3

5

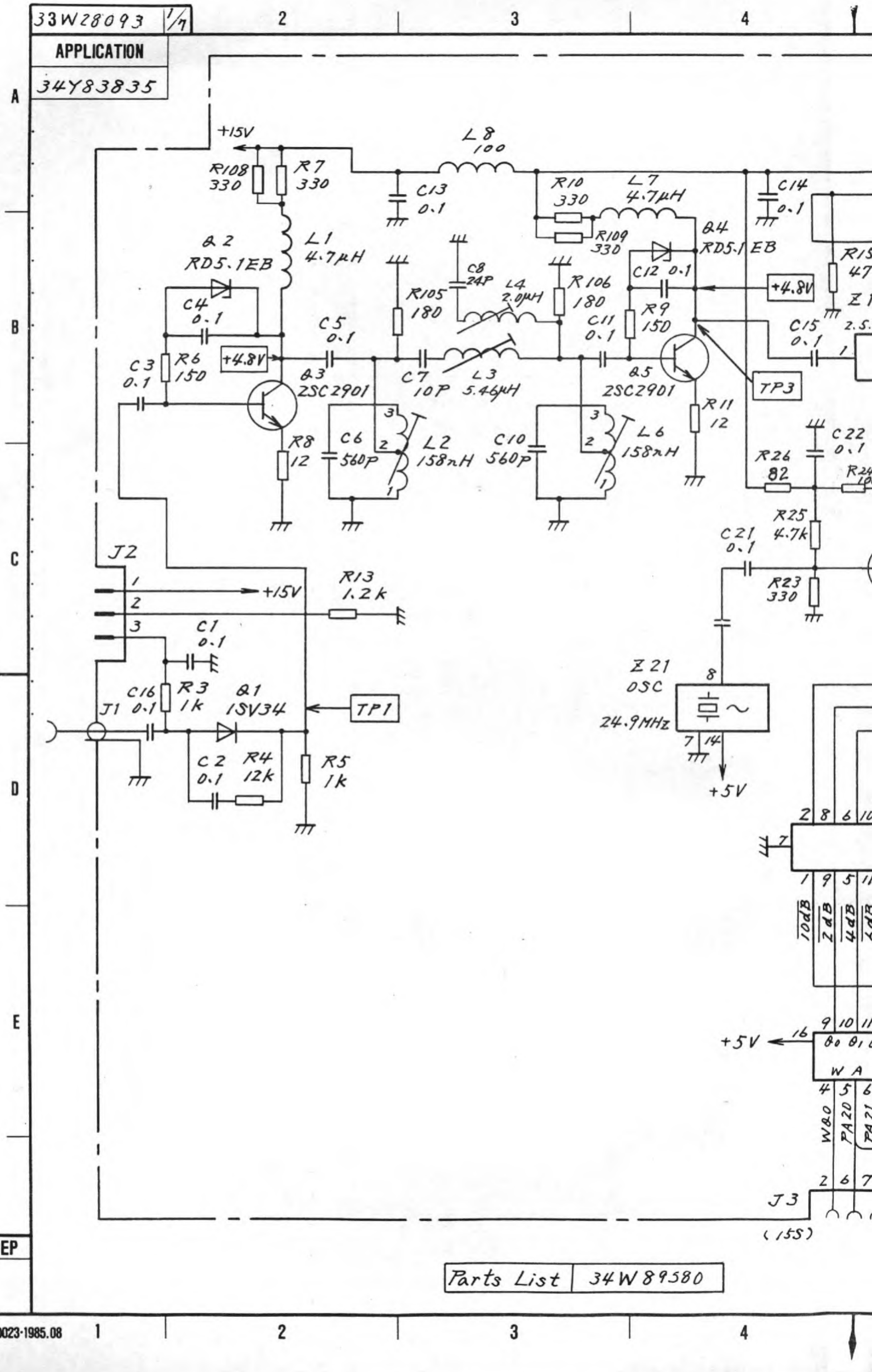
ANRITSU CORP.

4-15/4-16

33W28093 1/7

APPLICATION

34Y83835



DEP

Parts List | 34W89580

REVISIONS

L12 2.2μH
C26 1000P
R27 75
TP5
C27 220
R18 390
C28 220
L13 100
+15V
L14 100
-15V
Z2 MT05
Z3 MT05
C29, Z6-20
TP6
R156 47
Z1
TP4
2.5.6.7
M-8
3.4
C105 68P
C99 33P
L29 0.68μH
R19 1k
R153 1k
R16 15Ω
R21 12.4
C106 220P
R22 57Ω
R20 100k
C107 56P
R17 549
C18 5P
C101 10P
R30 35Ω
C102 10P
R31 22Ω
C103 22P
C108
R29
R28 1.33K
2P
60Ω
Z4 MT04
C24 0.1
C22 0.1
R24 100
+5.7V
Q9 2SC2901
C133 1
C140 1
R167 47
C134 1
C137 1
C139 1
C138 1
R166 47
R160 47
R161 47
R162 47
C135 1
C136 1
R163 47
R164 47
R165 47
Z6-2, Z12-2
Z8-2, Z14-2
K3-16
K4-16
Q11 7406
+5V
Q10 7406
+5V
10dB
20dB
Q27
Q27-13
Q27-12
Q40 TC4099BP
4dB
6dB
8dB
30dB
PA20
PA21
PA22
PA23
322U10018
(or 322U9289)

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

TITLE: IF Circuit Diagram

DRAWING No. 33W28093 1/7

7

ANRITSU CORP.

4-17/4-18

33W28093 2/7

APPLICATION

34Y83835

+15V

-15V

R38 220

C30 0.1

C31 20P

R36 8.2k

R39 470

K1

C29 0.1

8.9V

Q12 2SC943KL

3.1V

C32 20P

C33 10P

X1

Z3-1

R35 3.9k

R40 470

K1

J7

J6

R41 18.2k

-14V

C108 9P

MT03 Z6

1.17

C109 0.1

Q11-4

Q13 TC4051BP

16.3 → +12V

6.7.8 → -5V

1K 3K 10K 30K 100K 120K 300K 1M

L15

R132 33

11V

C58

C34

10P

100P

R43 15k

R42 120

Q15 1S953

Z7

2.8

C110 9P

1.17

No. D023-1985.08

5 6 7 8

REVISIONS

A B C D E F

C40 220 L17 100 +15V
L18 100 -15V
C41 220
R133 220
Q53 1S953 Q54 1S953
C126 0.1 R134 1k TP7
C35 20P
C19 100P
MT02 Z7
C36 20P C37 10P
K2 X2
L16 C59 10P C38 100P
R136 33
R47 15k
MT02 Z9
R137 220
C131 100P R138 1k
Q55 1S953 Q56 1S953
C127 0.1
2.6V TP8
Z12-20 C47 K3-11
-14V C110 9P
J9 J8 R45 18.2k
R46 120
C39 0.1
2,8
R34 100 Q20 2SC943K.L
R33 10K -15V Q19 1S953 R165 (1/7)
MT03 Z8
K2 Q17 1S953
R49 R50 R51 R52 R53
500 500 500 1K 1K
Q11-6
Q16 TC4051BP
3k 10k 30k 100k 120k 300k 1M
16.3 +12V
6.7.8 -5V
MT04 Z10
PC1-20 +5V
Q18 7406
$\overline{a}$ $\overline{b}$ $\overline{c}$ $\overline{d}$ $\overline{e}$ LIN(20dB)
Q41-12 Q41-13 Q41-14 Q41-15 Q41-1 IQ47-15
(2)

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	

TITLE: IF Circuit Diagram

DRAWING No. 33W28093 2/7

ANRITSU CORP. 4-19/4-20

33W28093 3/7

APPLICATION

34Y83835

+15V

−15V

Z9−9

Z9−3

Z9−4

C112 9P −15V

Z12 MT03

Q11−4

Q11−8

Q18−13 Q18−11 Q18−9 Q18−1 Q18−3

Q41 TC4099BP

+5V

WQ1 PA20 PA21 PA22 PA23

(1)

J3

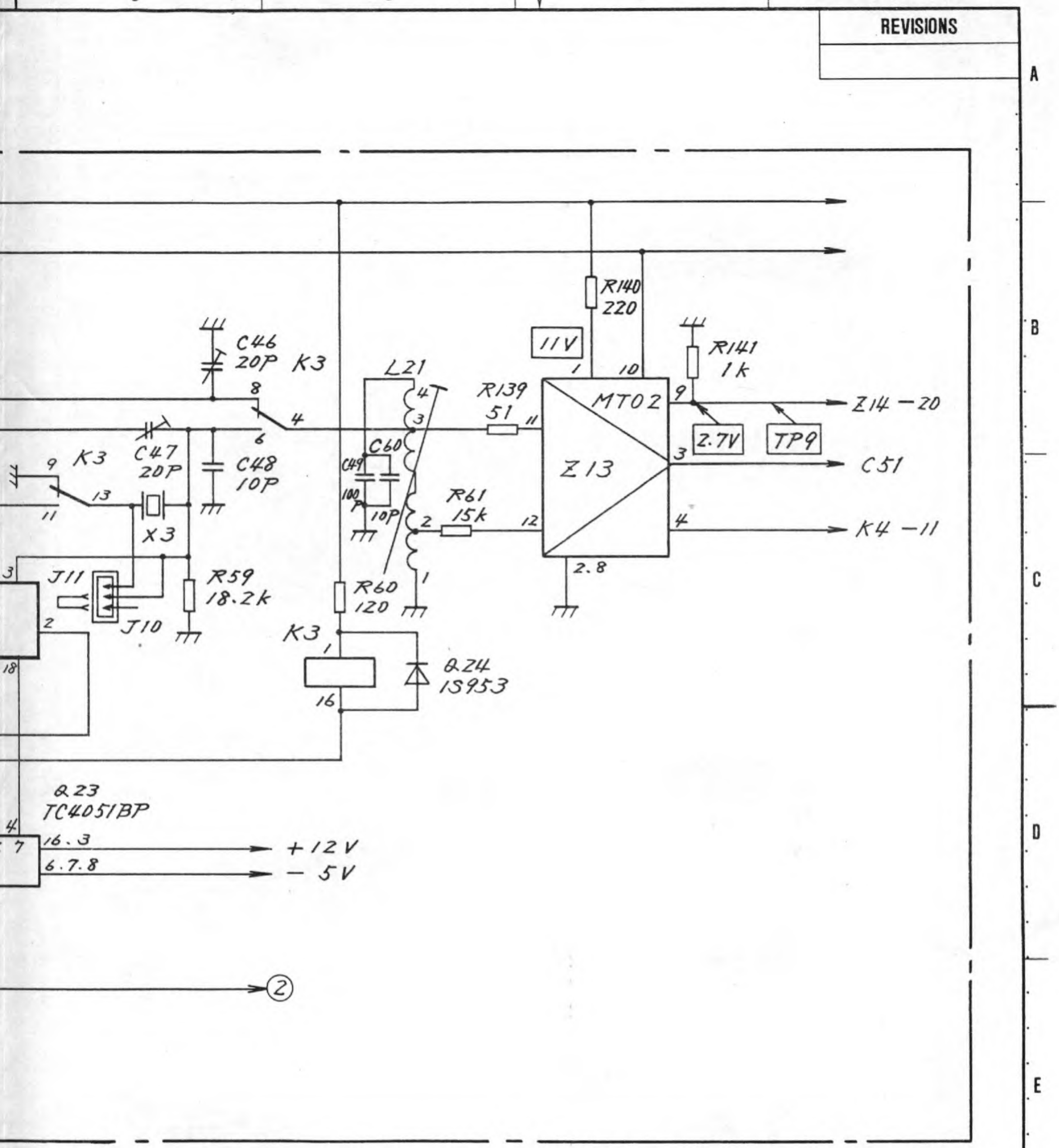
(155)

DEP

5 6 7 8

REVISIONS

A B C D E F



QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	

TITLE: IF Circuit Diagram

DRAWING No. 33W28093 3/7

ANRITSU CORP.

4-21/4-22

33W28093 4/7

APPLICATION

34Y83835

+15V

-15V

R143
220

11V

C50
20P

L22

R157

Z13-9

Z13-3

C51
20P

X4

K4

C52
10P

C61

C53

R65
15k

Z15
MT02

100P

10P

Z13-4

J13

-15V

C114
9P

R63
18.2k

J12

Z14
MT03

R64
120

C115
0.1

K4

Q26
1S953

Q11-6

Q11-10

Q11-9

Q11-3

Q25
TC4051BP

+12V

-5V

+12V

-5V

PC1-5

C122
220

+5V

PC1-4

C123
220

-5V

PC1-6

C124
220

DETECT OUT

DETECT OUT

J3

(155)

DEP

No. D023-1985.08

5 6 7 8

REVISIONS

A

B

C

D

E

F

C55 220 +15V

C56 220 -15V

PC1

LOG/LIN Relay 20 ← Q18-6

19

LOG CONT 18

QP 120k 17

SCALE C 16

SCALE B 15

SCALE A 14

QP(9k·120k) 13

QP 9k 12

VIDEO 100Hz 11

VIDEO OFF 10

DETECT OUT 9

DETECT OUT 8

7

-5V 6

+12V 5

+5V 4

3

-14V 2

+15V 1

10

2.7V TP10

9

L30

R145 1k

C132 330p

8

Q40-15 (1/7)

Q27 TC4053BP

13 12 1 3 5

X X̄ Y Z Z̄ 14

A B C

15 11 10 9 2

Q11-1 (1/7)

Q40-1(1/7)

LIN

QP(9K.120K)

Q46 TC4099BP

LC-ON

9 10 11 12 13 14 15 1

Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7

W A B C D

16 +5V

2,8

4 5 6 7 3

WQ2 PA20 PA21 PA22 PA23

4

VIDEO 100Hz

VIDEO OFF

SCALE A

SCALE B

SCALE C

LIN(20dB) Q18-5

Q47 TC4099BP

+5V

16

WQ3 PA20 PA21 PA22 PA23

5

1

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	

TITLE: IF Circuit Diagram

DRAWING No. 33W28093 4/7

ANRITSU CORP.

4-23/4-24

33W 28093 | 5/7

APPLICATION

34Y83835

+12V

-12V

+5V

Z16 MT06 LOG 1

Z17 MT07(A) LOG 2

Z18 MT07(B) LOG 3

Z19 MT07(C) LOG 4

-3.7V

-7.5V

-12V

C120 30P

C118 0.1

C119 0.1

C121 0.1

6 K5

8 4

Q6 1S953

C125 0.1

R72 8.2K

-12V

PC2-20

PC2-18

K5

9.5V

R154 1.5K

R146 390

R147 220

Q52 2SA1206

Q51 2SC945KL

4.2V

R148 1K

R149 330

L30 3.3μH

C117 0.1

C116 56P

R155 5.6K

Z15-9

DEP

No. D023·1985.08

5 6 7 8

REVISIONS

A

B

C

D

E

F

C63 220

L25 100

L26 100

C64 220

C67 1

C70 1

R81 6.8K

R83 3.3K

3V

Q32 2SC945

Q33 1SS97

Q34 2SS97

-5.7V

Q30 2SC945

Q31 2SC945

L27 1.5mH

C68 0.01

R77 1K

C69 0.01

-9.5V

C71 0.1

C75 0.01

C77 1000P

R86 1K

R87 1K

R79 5.6K

-6.3V

5.1V

R88 470

R89 4.7K

R90 4.7K

R91 8.2K

R92 5K

C73 18F

C82 0.1

C72 0.1

TP13

Q35 LM833

R150 1K

C74 22P

R93 5.6K

C80 330P

L28 470μ

C81 330P

R169

Q38-3

J14

J15

Q29 2SA1206

R76 150

R73 15K

R74 100

R168 180

C66 0.1

TP12

-5.5V

R78 6.8K

R82 1K

R84 2.7K

R85 1.5K

-12V

C76 0.1

7 (C)

4

14 12

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	

TITLE: IF Circuit Diagram

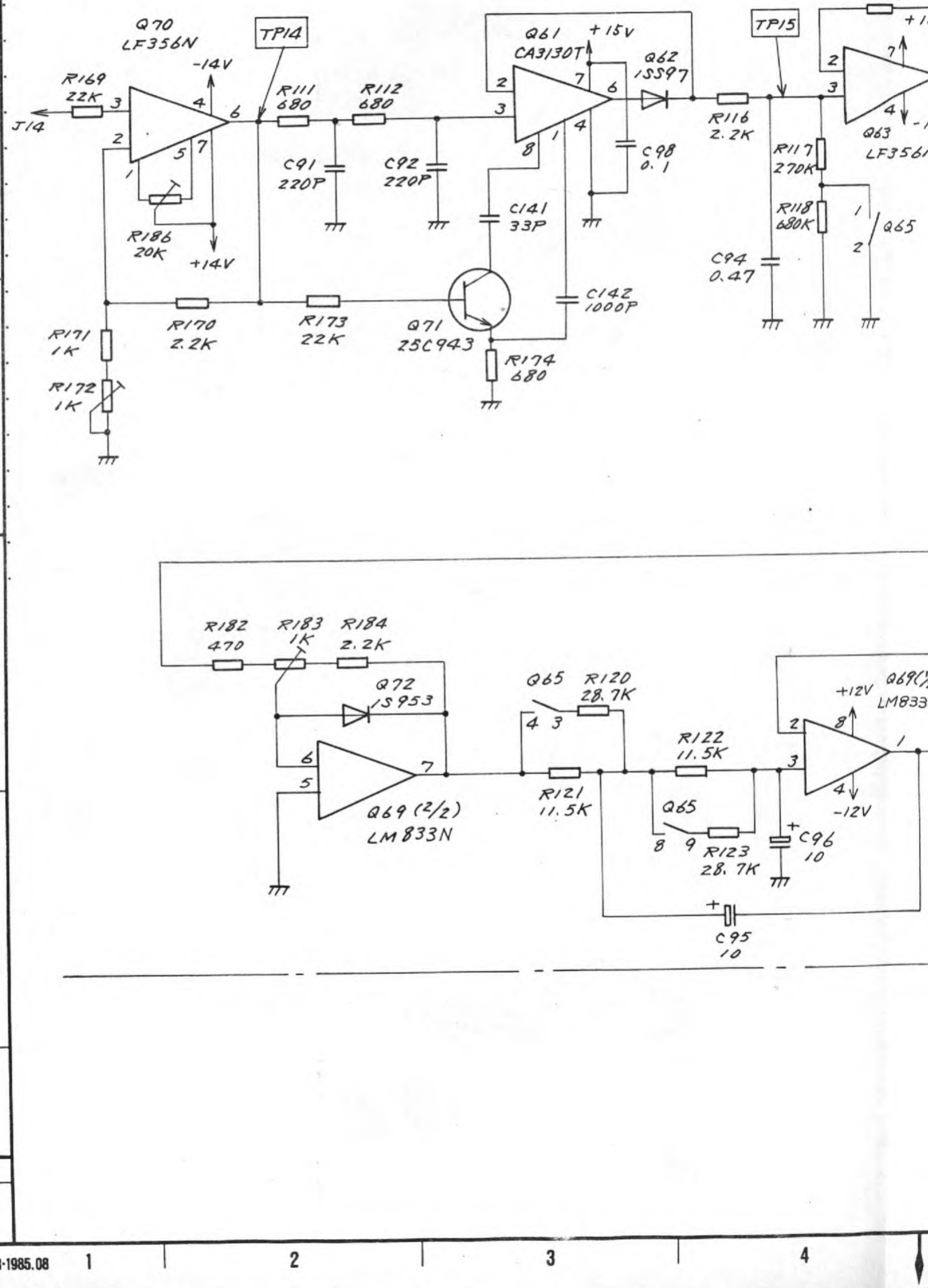
DRAWING No. 33W28093 5/7

ANRITSU CORP.

4-25/4-26

33W 28093 6/7

APPLICATION



DEP

5 6 7 8

REVISIONS

A

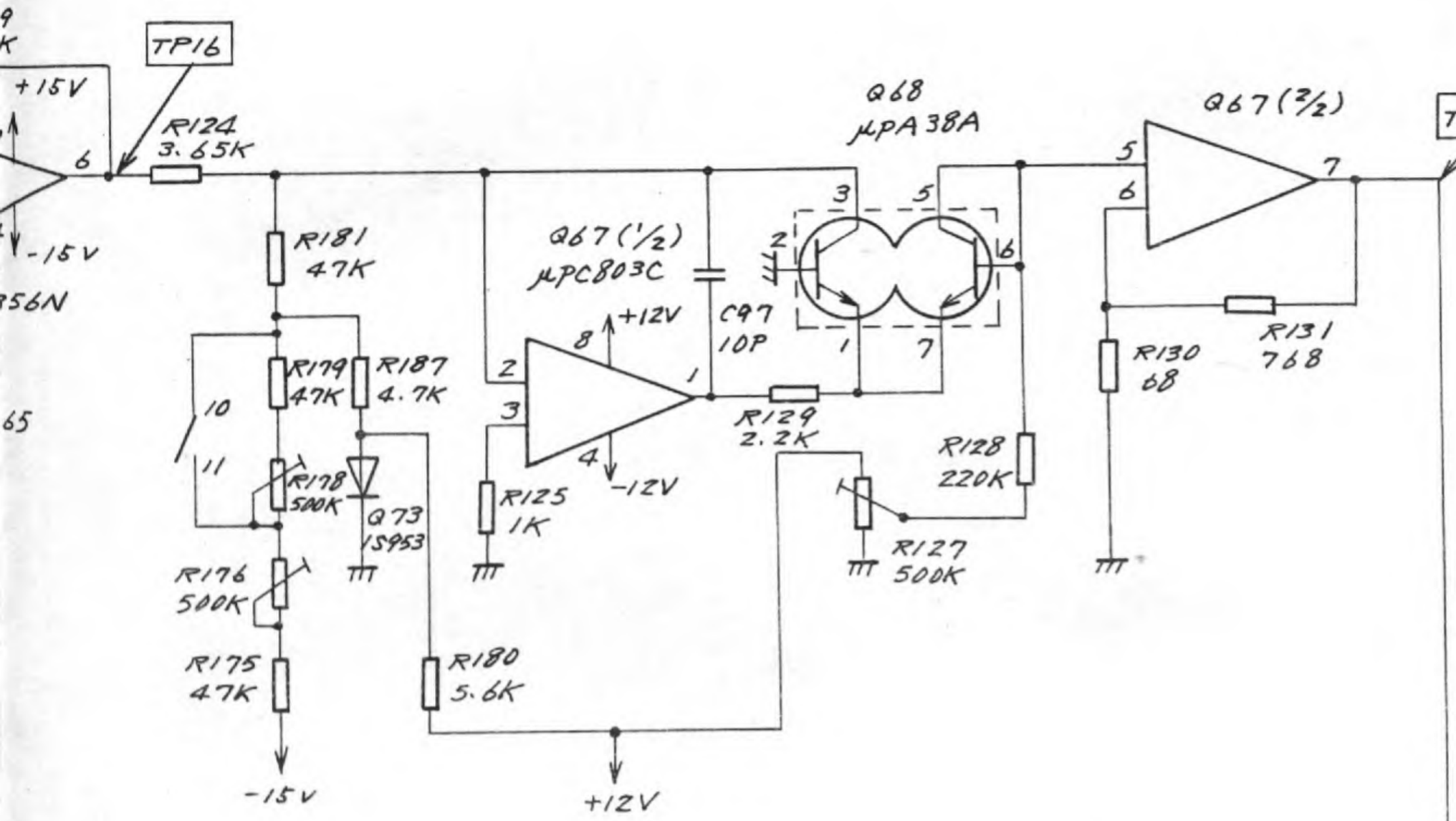
B

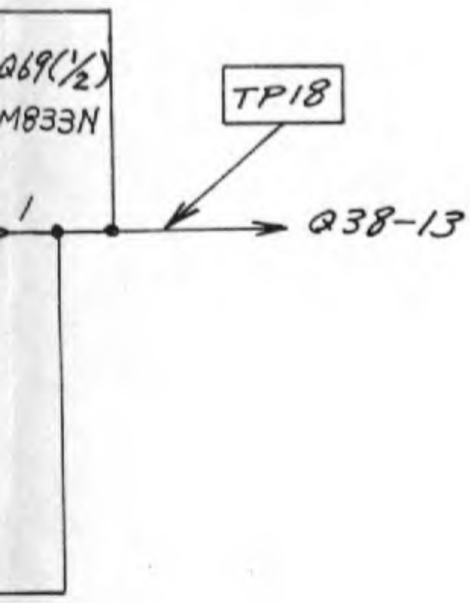
C

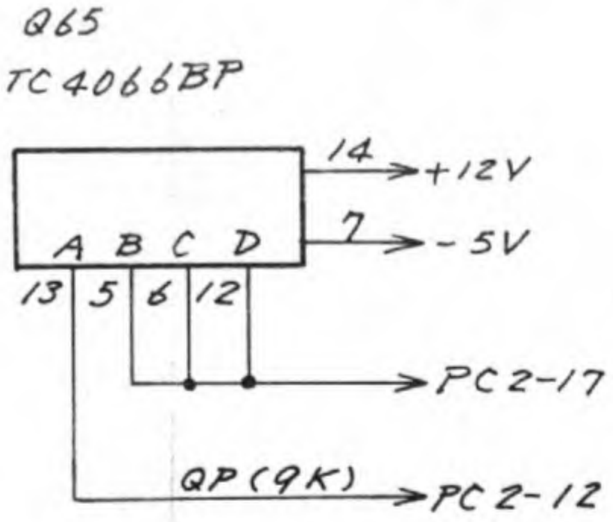
D

E

F







QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	
TITLE: IF (QP detector) Circuit Diagram		DRAWING No. 33W28093	6/7

ANRITSU CORP.

4-27/4-28

33W 28093 7/7

APPLICATION

34Y83835

R185
220

R104
220

-5V ← → -12V

C85
220 +

Q49
RD5.1EB

Q69-1 ←

13 14

Q38

L28 ←

3 4 12 14

R94
560

Q38

1 15

5 4

R95
150K

Q38

TP19

C79
0.01

+12V ←

-5V ←

Q39
TC4051BP

Q38
TC4053BP

7 8 16

6

A B C

11 10 9

R102
10K

R107
820

-12V ←

Q48
RD5.1EB

C84
1 +

TP21

TP22

1 11 13 14 15

J3

(155)

DEP

No. D023-1985.08

1 2 3 4

5 6 7 8

REVISIONS

A B C D E F

+12V

Q36
LF356N

7 3 6 2 4

TP20

3 1

Q39

-5V

3 14 R97 5K

3 15

3 12 R98 5K

R100 4.7K

Q37
LM833

5 7 6

R101 1K

C128 0.1

R103 8.2K

Q35 R152 2.2K R151 2.2K

TP21

7 6 5

+12V

Q37

8 2 1 3 4

-12V

PC2

K5-1 ← LOG/LIN Relay 20
19
Z17-11 ← LOG, CONT 18
Q65 5,6,12 ← QP 120K 17
SCALE C 16
SCALE B 15
SCALE A 14
QP (9K 120K) 13
Q65-13 ← QP 9K 12
VIDEO $\overline{100Hz}$ 11
VIDEO $\overline{OFF}$ 10
$\overline{DETECT\ OUT}$ 9
DETECT OUT 8
7
← -5V 6
← +12V 5
← +5V 4
GND 3
-15V 2
+15V 1

C143 220 +

Q58 2SA1154

C130 220 + R159 560

Q57 2SC1826S

C129 220 R158 75

+12V -12V +5V +15V -15V

J5 1 2 3 4 5 6 7 8 9 10

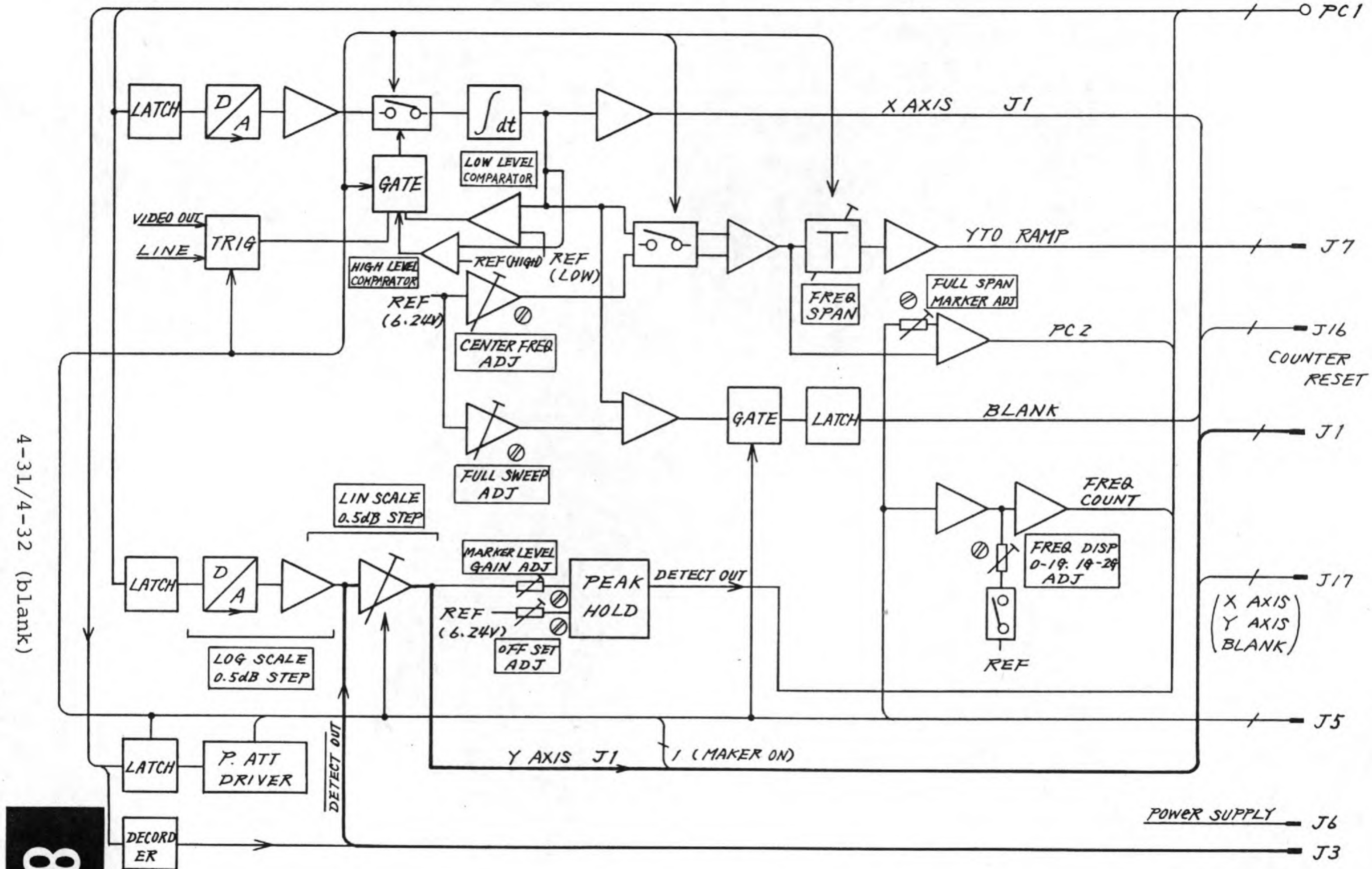
QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	7
APPROVED BY	DRAWN BY	:	

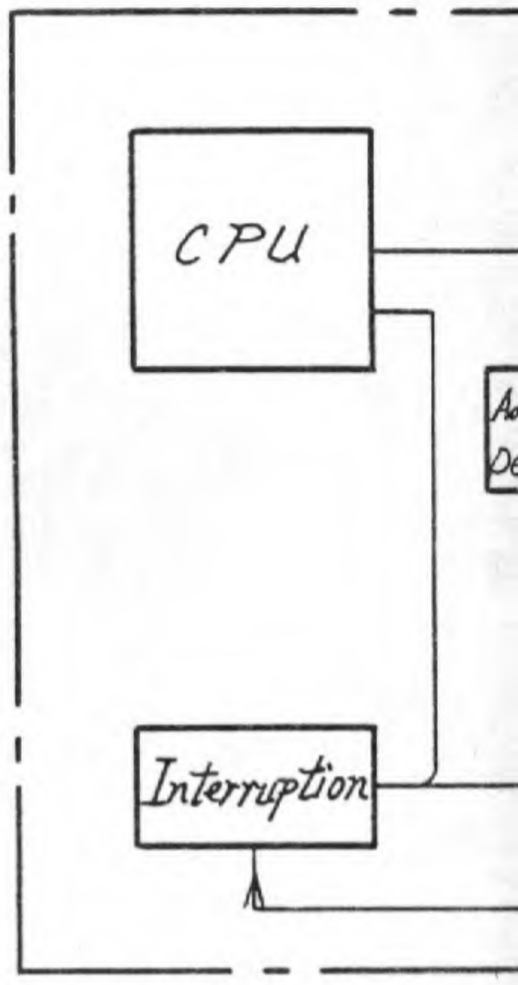
TITLE: IF Circuit Diagram

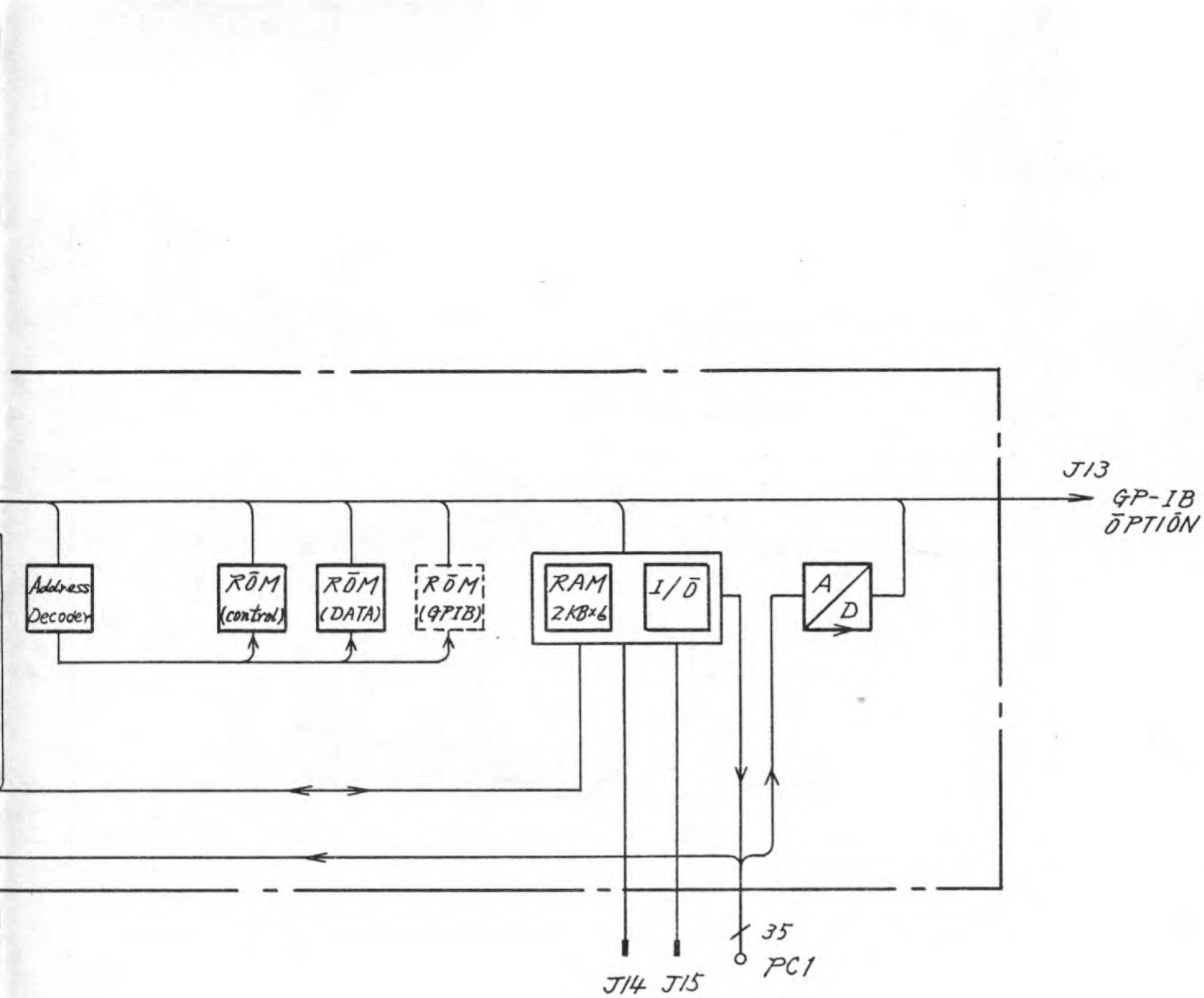
DRAWING No. 33W28093 7/7

ANRITSU CORP. 4-29/4-30



SCAN & CPU Block
(SCAN) Diagram


CPU
Interruption

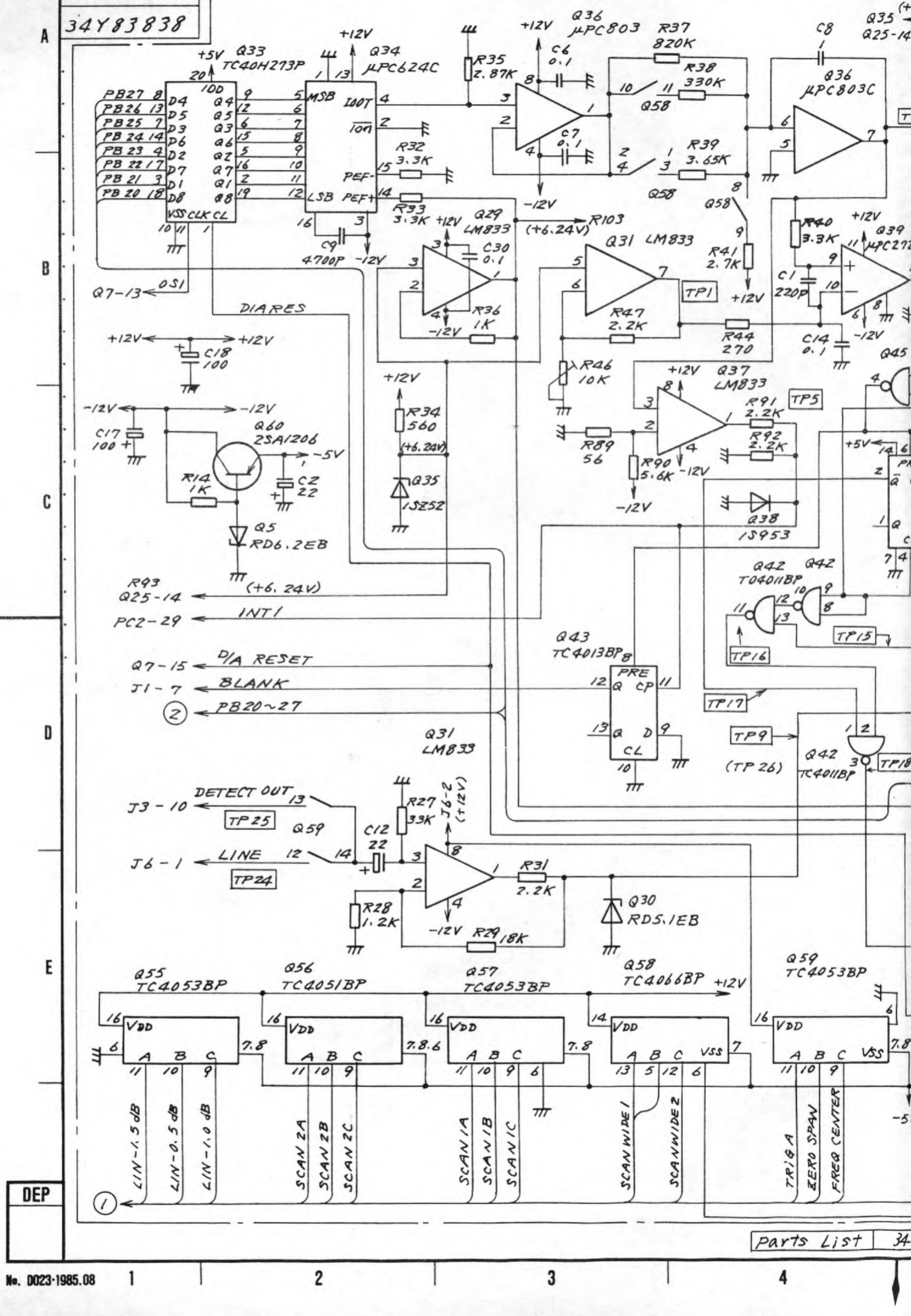


SCAN & CPU
(CPU)
Block Diagram

33W 28095 1/5

APPLICATION

34Y83838



DEP

Parts List 34

5 6 7 8

REVISIONS

A

B

C

D

E

F

(+6.24V) R93 6.8K R94 2.2K R50 5K R95 2.2K Q29 LM833 TP2 Q59 R79 1.2K R56 470 R57 1K R80 10K +12V TP6 C15 27P XAXIS J1-11 Q48 LM833 R81 6.8K R82 1K R55 2.2K R52 2.2K R106 2.7K R53 1.8K R54 2.2K -12V Q48 LM833 R105 10K -12V R78 5.6K +5V Q39 μPC272C R101 5.6K 220 C24 TP3 R75 150 Q39 μPC272C TP4 R102 5.6K +5V Q50 LM833 TP7 R58 4.02K R59 2K R60 2K Q57 R61 9.09K R62 909 R63 90.9 Q56 1M 10K 100K 10M R64 10.0 TP8 -12V YTO RAMP J7 R107 560 R100 22K +12V R109 6.8K R96 4.7K R97 2.2K R98 5K Q37 LM833 R99 2.2K R100 2.2K INT3 PC2-23 TP23 Q46 1S953 R7 J5-9 R73 2.7K +12V Q45 TC4011BP TP13 Q41 TC4013BP Q44 TC4011BP Q42 TC4011BP Q44 TP11 TP12 TP14 +5V Q43 RPE SCAN RESET STOP (INT2) Q8-11 PC2-20 SCAN START Q7-1 R66 220 C5 0.01 Q40 TC4011BP Q40 TC4011BP Q44 TC4011BP TP10 Q53 μPC624C +12V C11 0.1 R69 4.7K Q54 LM833 R70 1.2K R71 75K R72 3.3K R84 1.2K R85 3.3K Q54 LM833 YAXIS J1-12 TP19 R74 15K Q55 R86 3.9K R87 5.6K R88 12K DETECT OUT J3-12 TP18 Q52 TC40H273P +5V PB27 PB26 PB25 PB24 PB23 PB22 PB21 PB20 D4 D5 D3 D6 D2 D7 D1 D8 Q4 Q5 Q3 Q6 Q2 Q7 Q1 Q8 VSS CLK CL D/A RESET R67 3.3K R68 3.3K C10 4700P -12V MSB LSB IOUT IOUT REF- REF+ TRIG.C (FREE RUN) CS2 Q7-14 -5V 7.8

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	10
APPROVED BY	DRAWN BY	:	

TITLE SCAN & CPU Circuit Diagram (SCAN)

DRAWING No. 33W28095 1/5

322U9261

34W89584

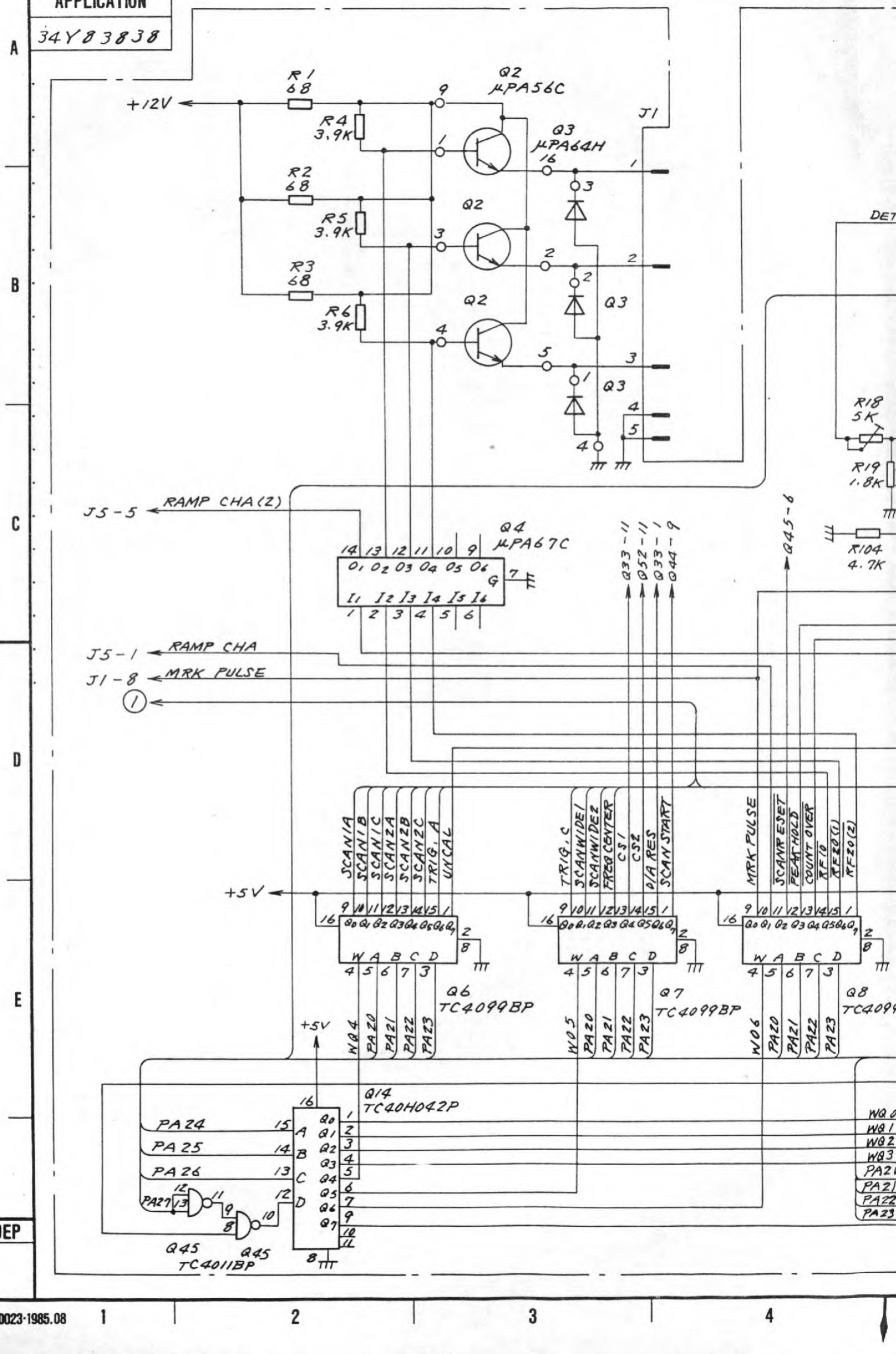
ANRITSU CORP.

4-35/4-36

33W28095 2/5

APPLICATION

34Y83838



No. D023-1985.08

5 6 7 8

REVISIONS

A B C D E F

R76 33K
R77 5.6K
C16 0.1
-12V
R9 2.21K
+12V
R7 2.21K
R98
TP21
2
8
1
3
4
Q15
DETECT OUT
A
R8 1K
-12V
R10 22.1K
R13 22.1K
6
7
5
Q15 LM833
TP22
Z
R11 30.1K
R16 10K
R12 10K
C13 0.01
13
14
Q25
R93
Q35
R22 10K
Q20 1S953
R23 1M
+12V
TP20
Q23 µPC803C
Q21 1SS97
R24 15
-12V
Q25
R25 4.7K
-12V
Q22 1SS149H
15
1
Q25
C4 0.22
R26 100
Q32 1S953
Q25 TC4053BP
16
VDD
VSS
A B C
11 10 7
7,8
6
+12V
-5V
MRK PULSE
PEAK HOLD
COUNT OVER
R18 5K
R19 8K
R20 3.9K
Q23
R104 4.7K
RZ1 2K
R103 120
Q40 TC4011BP
5
6
4
(+6.24V)
Q29-1
RAMPCHA(1)
J5-2
J5-3
J5-4
J1-6
MRK ON
LIN-0.5dB
LIN-1.0dB
RAMPCHA(1)
FULL SPAN
D/A OUT (GP IB)
ZERO-SPAN
LIN-1.5dB
9 10 11 12 13 14 15 1
Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7
W A B C D
4 5 6 7 3
WQ7 PA20 PA21 PA22 PA23
Q9 TC4099BP
Q40-14
Q42-14
Q44-14
Q45-14
+5V
+C3 100
C19 0.1
C20 0.1
C21 0.1
C22 0.1
C23 0.1
+5V
Q40-7
Q42-7
Q44-7
Q45-7
WQ0 → J3-2
WQ1 → J3-3
WQ2 → J3-4
WQ3 → J3-5
PA20 → J3-6
PA21 → J3-7
PA22 → J3-8
PA23 → J3-9

PC2

1	
PA20	2
PA21	3
PA22	4
PA23	5
PA24	6
PA25	7
PA26	8
PA27	9
FREQ COUNT	10
DETECOUT	11
PB20	12
PB21	13
PB22	14
PB23	15
PB24	16
PB25	17
PB26	18
PB27	19
Q45-2 INT2 (STOP)	20
ZERO ADJ	21
	22
R99 INT3	23
CHIP. SEL	24
	25
+5V	26
	27
GND	28
Q38 Q43-11 INT1	29
+6.24V	30
	31
	32
	33
+12V	34
	35
-12V	

to PC1 (5/5)

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY | TRACED BY | SCALE :

APPROVED BY | DRAWN BY

TITLE SCAN & CPU Circuit Diagram (SCAN)

DRAWING No. 33W28095 2/5

10

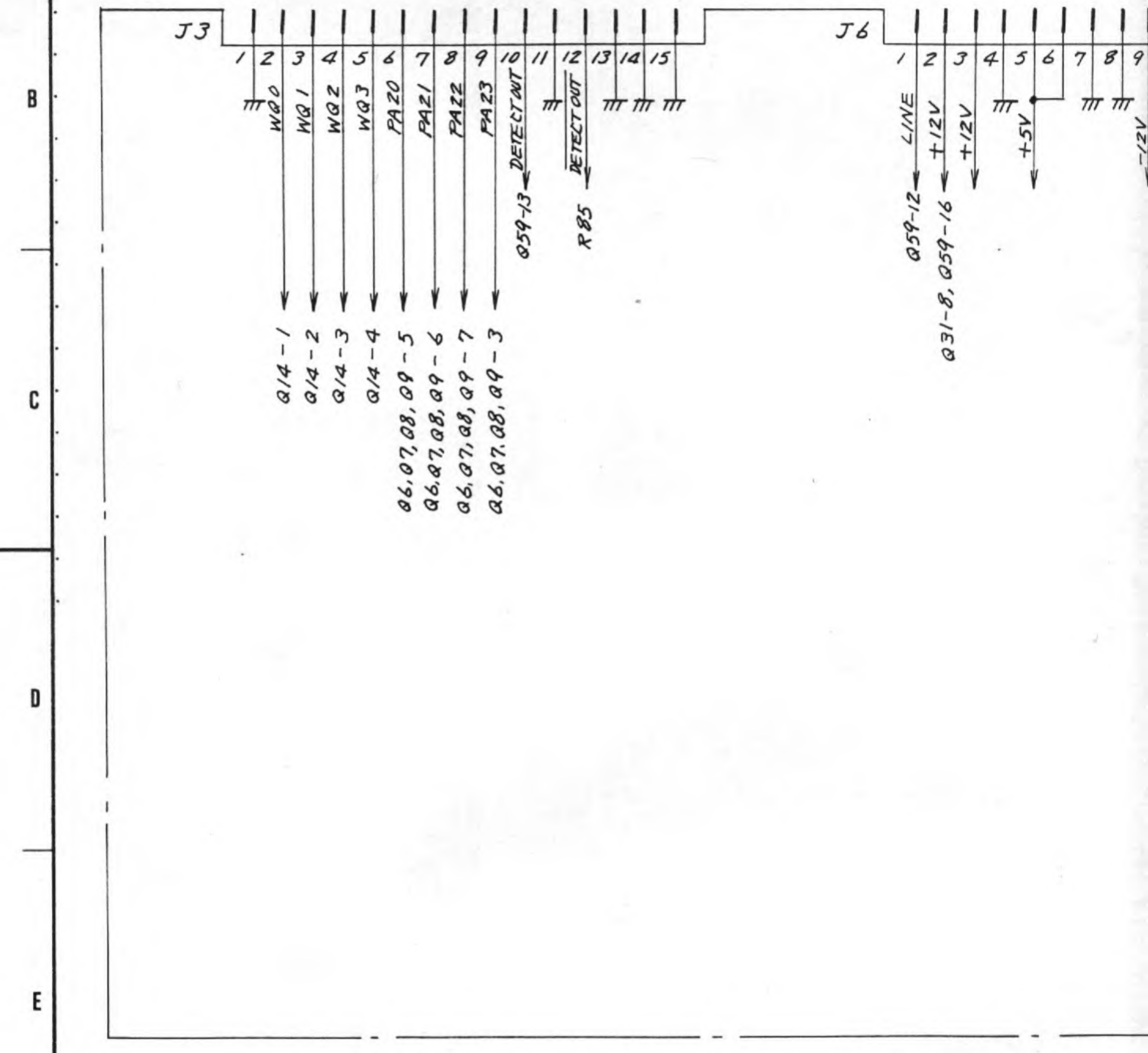
ANRITSU CORP.

4-37/4-38

33W 28095 3/5

APPLICATION

34Y83838



DEP

5 6 7 8

REVISIONS

to YTO DRIVE

J5

8	9	10
	-12V	

1	2	3	4	5	6	7	8	9	10
RAMPCHA	RAMPCHA(1)	FULL SPAN	GP-IB D/A	RAMPCHA(2)				EREQ VOLT	
Q8-10	Q40-4	Q9-13	Q9-14	Q4-14				R98	

J7

1	2	3	4	5	6	7	8	9	10
								YTO RAMP	
								Q50-7	

J1

Q9-9	MRK ON	6	
Q43-12	BLANK	7	
Q8-9	MRK PULSE	8	
		9	
		10	to CRT
C15	X	11	DRIVE
Q54-7	Y	12	
		13	
		14	
		15	

J6-2	+12V	1	
J1-11	X	2	
J6-9	-12V	3	
J1-12	Y	4	to XYZ
J6-5	+5V	5	OUTPUT
J1-7	BLANK	6	
		7	
		8	

J17

A B C D E F

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY		TRACED BY	SCALE :
APPROVED BY		DRAWN BY	

TITLE SCAN & CPU Circuit Diagram (SCAN)

DRAWING No. 33W28095 3/5

10

5

ANRITSU CORP.

4-39/4-40

33W 28095 4/5

APPLICATION

34Y83838

DEP

Part List 34W89

No. D023-1985.08

REVISIONS

Q80 TC40H155P

Q95 TC40H0CAP

Q93 TC40H0COP

Q83 HN482764

Q89 HN4627328

Q88 (HN4627328)

(ADDRES BUS) A8~15

Q81 TC40H373P

(ADDRES BUS) A0~7

(DATA BUS)

Q85 MSM81C55

Q86 MSM81C55

Q98 MSM82C53RS

Q79

C41 C42 C43 C44 C45 C46 C47 C48 C49 C50 C51 C52 C58 C59 C60 0.1

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY
APPROVED BY	DRAWN BY

SCALE :

10

TITLE SCAN & CPU Circuit Diagram (CPU)

DRAWING No. 33W28095 4/5

34W89584

ANRITSU CORP.

4-41/4-42

PC1

Q90 TC4013BP

Q77-37 → Q94-4

TP28

R126 1.21K
R139 2.05K
C36 0.1
R128 1K
R129 4.75K
C38 0.1
R131 4.99K
C39
R132 5K
C57 0.1

Q91 μPD7002C

+5V

Q84-12 → (7)

Q96 TC40H004P
C54 330P
R133 6.8K

(8) (10)

PA20
PA21
PA22
PA23
PA24
PA25
PA26
PA27
FREQ COUNT
DETEC OUT
PB20
PB21
PB22
PB23
PB24
PB25
PB26
PB27
INT2 (STOP) → Q71-11
ZERO ADJ
CHIP SEL(PB17)
+5V → C41~52
INT1
(+6.24V)
+12V
-12V

Q95 TC40H004P
Q93 TC40H0COP
C53 330P
R140 6.8K
Q72-3 INT3

C40 100

Q79 TC40H004P
Q96 TC40H004P
Q71-3 INT1
C55 330P
R134 6.8K
INT5 → Q73-3
Q97 TC4011BP
C56 2200P
R135 220
(PC15) → (6)
Q97 N.C

(3) → Q95 R23 R24 R25
R136 10K
R137 10K
R138 10K
Q95 TC40H004P

(1) → PA10 PA11 PA12 PA13 PA14 PA15 PA16 PA17 PC10 PC11 PC12 PC13 PC14 INT5 PB17 UNCAL ZERO ADJ +5V

(6)

J15 J14

DEP

No. D023·1985.08

5 6 7 8

REVISIONS

A B C D E F

J13

+5V ← 1, 2

3, 4

RST 5

CLOK 6

$\overline{RD}$ 7

$\overline{WR}$ 8

9

AD0 10

AD1 11

AD2 12

AD3 13

AD4 14

AD5 15

AD6 16

AD7 17

A8 18

A9 19

A10 20

IO/M 21

CS5 22

CS6 23

24

PB20 25

PB21 26

PB22 27

PB23 28

PB24 29

PB25 30

PB26 31

PB27 32

PB16 33

34

35

36

37

38

39

40

+12V

-12V

R145 10K

Q79 TC40H004P

INT4 10 11 ← Q72-11

(8)

(10)

Q96 TC40H004P

Q96 TP31

1 2 3 4 → Q74-3

INT 7

R133 6.8K

(9) ← Q84-11

Q84-10 ←

(5)

(2)

Q93-8 ←

+5V

Q97

N.C 10 9 8

(PC15) (6)

UNCAL

ZERO ADJ

+5V

16 17 18 19 20

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	10
APPROVED BY	DRAWN BY	:	

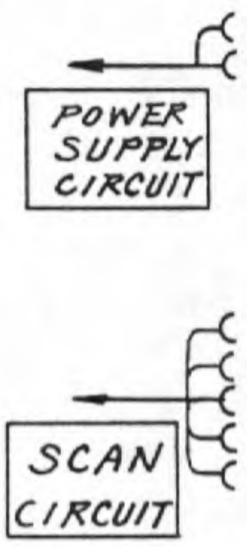
TITLE SCAN & CPU Circuit Diagram (CPU)

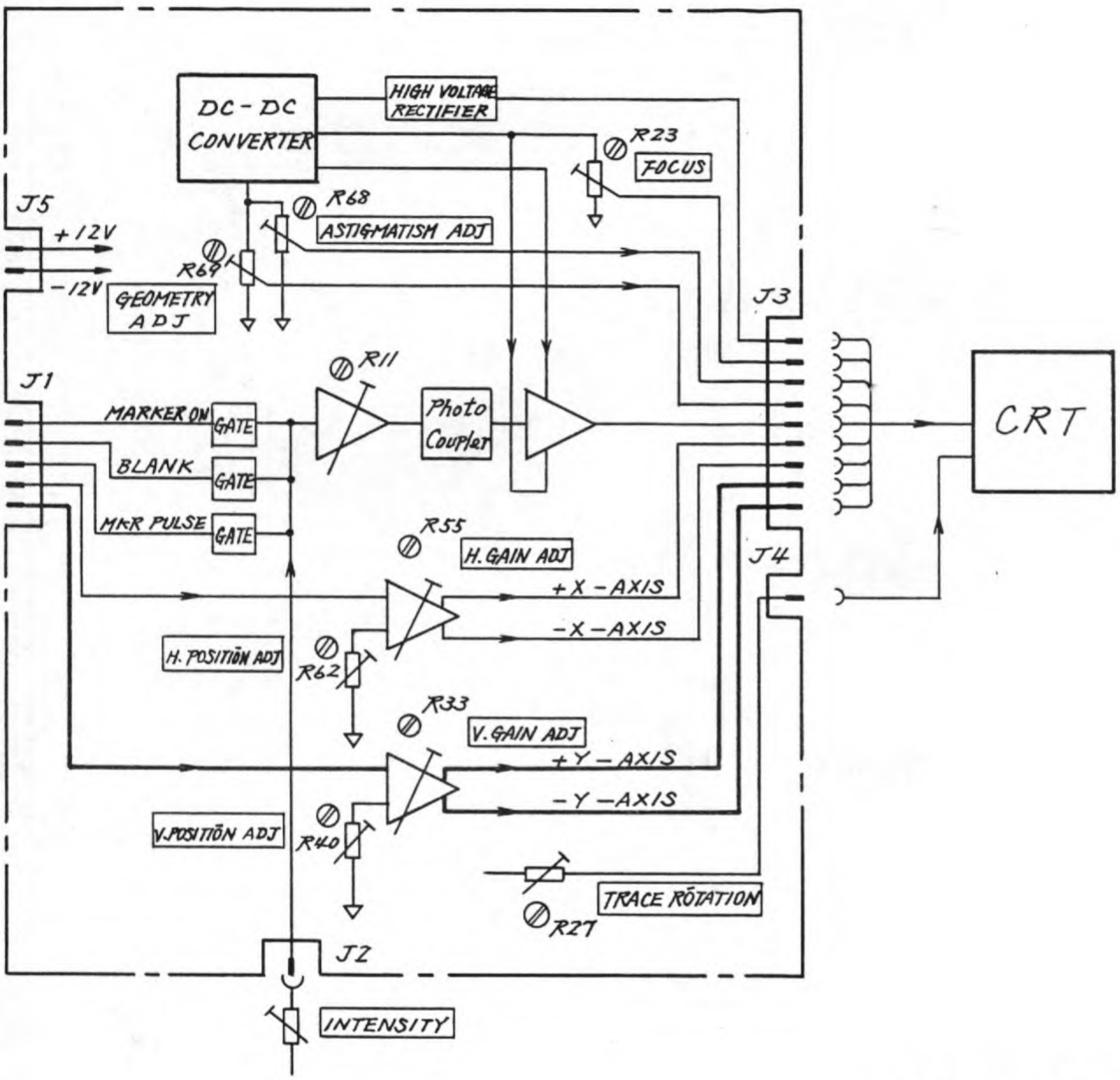
DRAWING No. 33W28095 5/5

5

ANRITSU CORP.

4-43/4-44


POWER
SUPPLY
CIRCUIT
SCAN
CIRCUIT



CRT DRIVE

Block Diagram

11

33W26568 1/2

APPLICATION

34Y83841

+5V
R1 1K
R2 12K
TP19
Q5 2SC2718
R3 1K
Q1 7406
Q2 1S953
R4 3.3K
Q6 2SC2718
Q44 2SA1151
Q7 PS2006B
Q8 RD5.1E
R13 10K
Q9 2SA845
Q10 2SA84
Q11 2SA845
Q12 2SA84
-1380V
R17 2.2K
R18 3.3K
-1500V
R19 1K
Q13 2SA845
R20 1K
R6 47K
R5 2.2K
Q3 1S953
R81 820
R8 5.6K
R11 1K
-12V
R10 10K
R79 3.3K
R80 2.2K
R82 560
R83 6.8K
R84 10K
R85 33K
Q47 2SA1206
R9 15K
R12 4.7K
TP16
TP17
TP18
(MKR ON)
(BLANK)
MKR RLUSE
R88
R89
J1
J2
J1-
J3-
J5
C21 0.1
Q45 μPC14312
C23 100
+15V
+12V
TP1
Q46 μPC16312
TP2
-15V
-12V
C22 0.1
C24 100
+5V
Q1-14
Q1-7
+160V
R68 100K
R69 100K
C6 0.1
J3
(15P)
332U2
Parts List
DEP
No. D023-1985.08

5 6 7 8

REVISIONS

A B C D E F

J4 1 2 3

C13 C14

R14 470

R26 330 +12V

R27 2K

-12V R28 330

Q23 2SC1279S

R15 15K

R16 100K C2 22P

Q10 2SA845

Q15 RD5.1EB

TP20

Q12 2SA845

C4 100P

R22 2.4M

R86 18K

R21 1K

R23 500K

C5 2200P

R25 1.2M

Q14 2SA845

C1 0.1

Q16 RD 5.1EB

C3 2200P

R24 1.5M

R87 2.2K

R89 6.8K

+12V

R39 22K

R40 1K

R41 220

J1-7

J3-3

R29 1M

+160V

R31 100K

R30 10K

85V

Q20 2SC1279S

J3 12 (15P)

Q22 13V μPA39A

Q21 2SC1279S

TP14

R32 56K

(Y) TP13

R33 5K

R34 2.2K

R35 220

+12V

R38 220

R37 2.2K

R36 4.7K

Q22 μPA39A

Q24 2SC1279S

R42 56K

Q18 2SC2718

13V

13 TP15

6V

85V

Q25 2SC1279S

R49 2.2K

R43 10K

R45 100K

R44 1M

+160V

R46 3.3K

-12V

5.5V

Q17 2SA1151

R47 2.7K

R48 3.3K

TP10

J1-6

(X)

R50 2.7K

R52 10K

R51 1M

+160V

R53 150K

85V

Q26 2SC1279S

13V

Q19 2SC2718

Q27 2SC1279S

14 TP11

Q28 μPA39A

R54 82K

R57 820

R56 1.5K

+12V

R88 1K

R55 5K

R58 2.2K

R59 1.5K

R60 820

R64 82K

+12V

R61 47K

R62 1K

R63 220

Q28 μPA39A

Q30 2SC1279S

85V

15 TP12

13V

Q31 2SC1279S

R67 150K

R65 10K

R66 1M

+160V

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	12
APPROVED BY	DRAWN BY	:	

TITLE: CRT DRIVE Circuit Diagram

DRAWING No. 33W26568 1/2

332U25790

34W85994

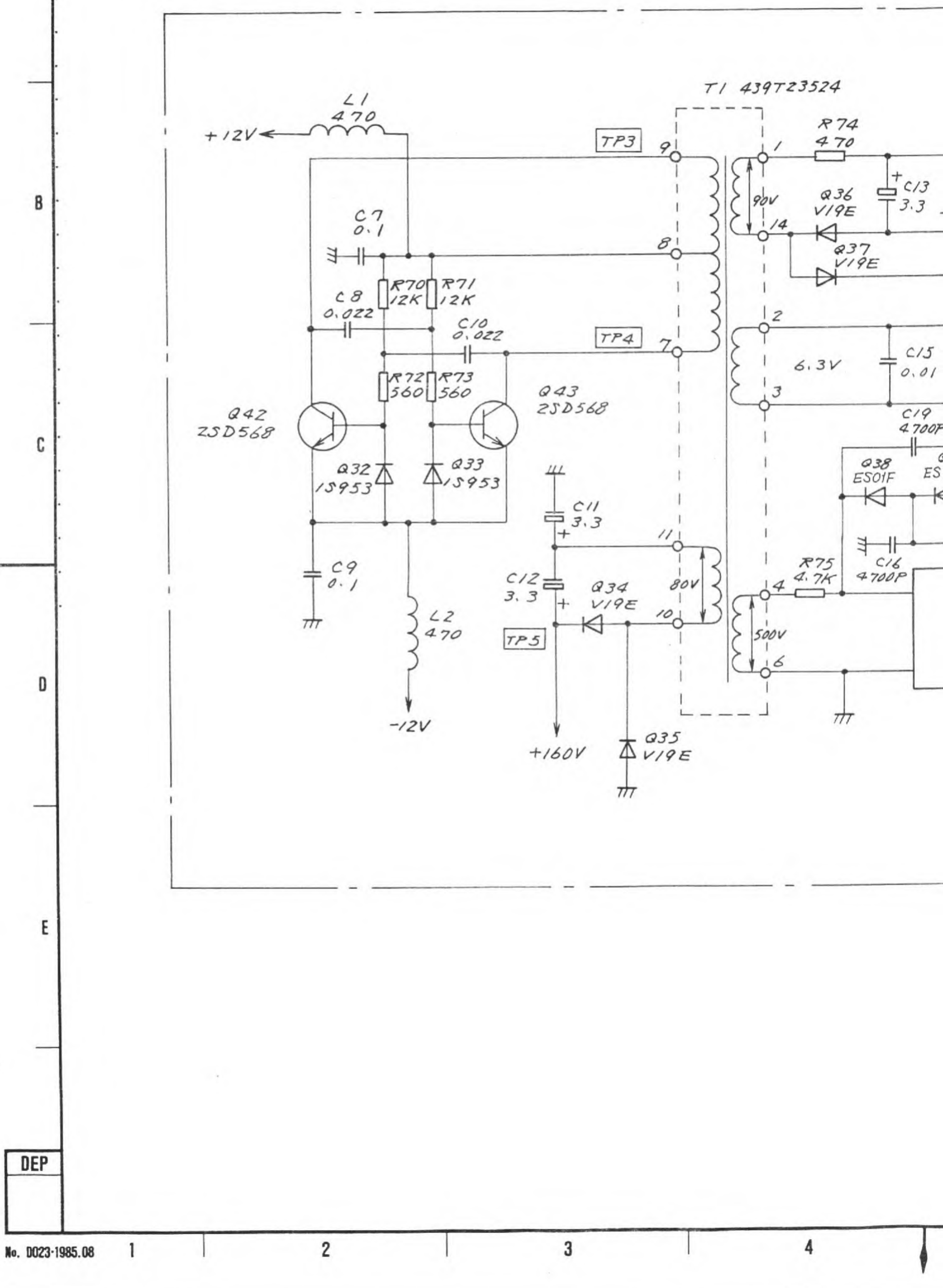
ANRITSU CORP.

4-47/4-48

33W26568 2/2

APPLICATION

34Y83841



DEP

5 6 7 8

REVISIONS

A B C D E F

TP9 → R15

C13 3.3

C14 3.3 +

TP8 → R13

→ R25

C15 .01

TP7

C19 4700P

Q39 ES01F

Q40 ES01F

R77 10K

R76 220K

C17 4700P

TP6

C20 2200P

C18 2200P

Q41 MSL4532

J3 1 2 3 4

Anode Cap (15P)

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	

CHECKED BY	TRACED BY	SCALE	12
APPROVED BY	DRAWN BY	:	

TITLE: CRT DRIVE Circuit Diagram

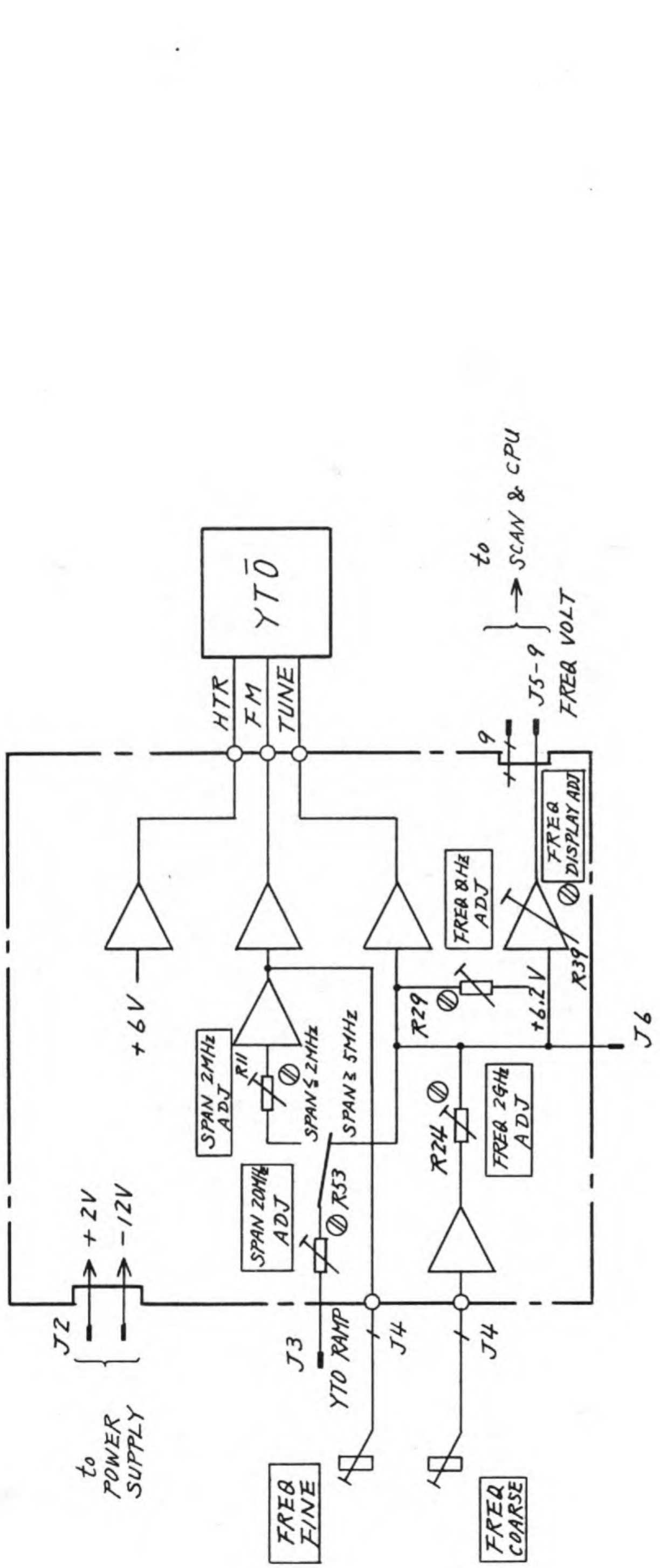
DRAWING No. 33W26568 2/2

ANRITSU CORP.

4-49/4-50

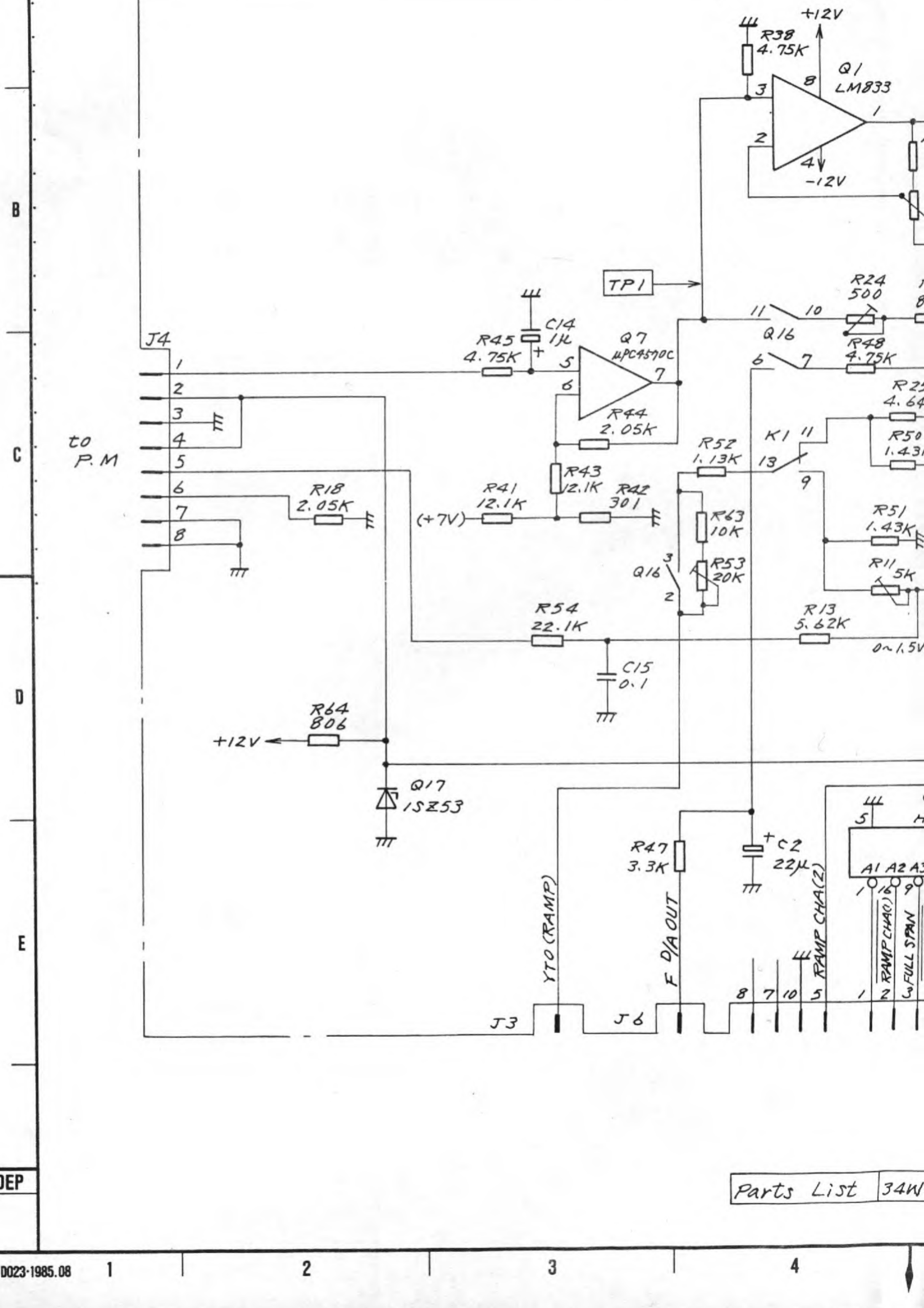
YTO DRIVE Diagram

Block Diagram



33W26569	1/2

APPLICATION
34Y83848



Parts List	34W

DEP

5 6 7 8

REVISIONS

A B C D E F

3

R65
100

TP2

R39
2K

R66 8.2K

R49
8.25K

→ Q7-2

K

R25
4.64K

C5
0.022

R50
1.43K

(7V)

R57
4.75K

51
43K

R55
33.2K

11
5K

Q4
LM833

TP3

R58
4.75K

→ Q4-2

~1.5V+0.2V

R59
4.64K

R56
2.2K

R61 14
390

Q16

15

C21
0.1

R60
22K

→ C12

Q16
HI201

13 → +12V

A2 A3 A4 4 → -12V

9 8

N RAMP CHAR

C3 FULL SPAN

4 GP-IB P/A

6

9 FREQ VOLT

J5

332U25796

332U25796

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	14
APPROVED BY	DRAWN BY	:	

34W85995

TITLE
YTO DRIVE Circuit Diagram

DRAWING No.
33W26569 1/2

5

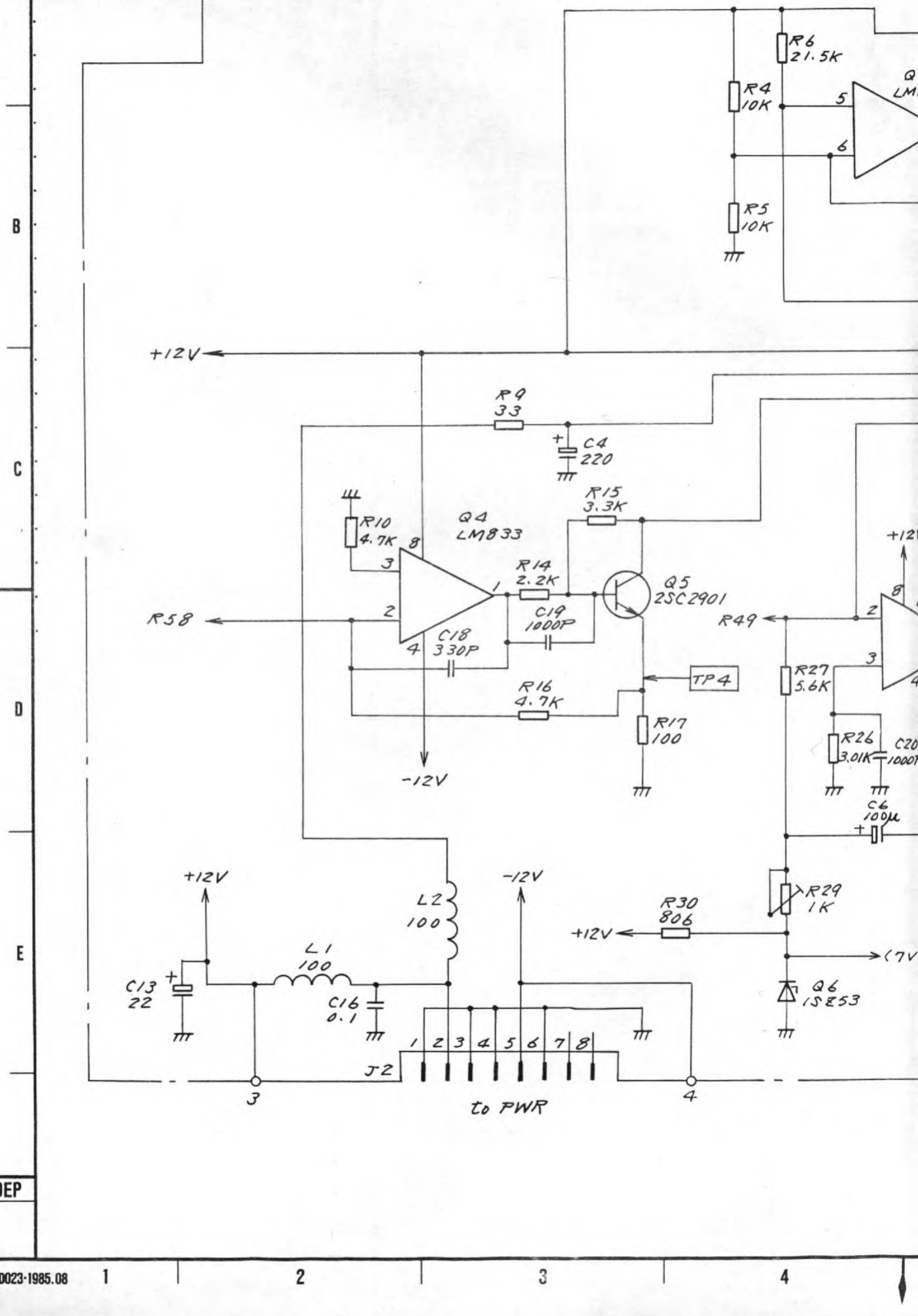
ANRITSU CORP.

4-53/4-54

33W26569 2/2

APPLICATION

34Y83848



DEP

5 6 7 8

REVISIONS

A

R7 33

Q1 LM833

7

Q3 2SC1826S

R8 68K

C3 0.1

+ C17 100

R34 33

1 2

PC1

TP5 1

2

HTR1

HTR2

B

TP6 3

HTR3

4

Y.T.O

5

TP7 6

+12V

TP8 7

+FM

-FM

+TUNE

C

R62 3.9K

R33 47K

C8 4700P

Q10 1S2222

+ C11 470

+12V

Q7 LM833

8

1

4

R31 1K

C7 22 +

Q8 2SA1206

K1

8

4

R35 1.5K

TP9 8

-TUNE

9

E

10

Q9 2SC1826S

R32 120

+ C9 4.7

C10 100 +

-12V

C20 1000P

K1

16 1

+12V

C12 0.1

Q11 1S953

J5-5

D

E

(7V)

F

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	14
APPROVED BY	DRAWN BY	:	

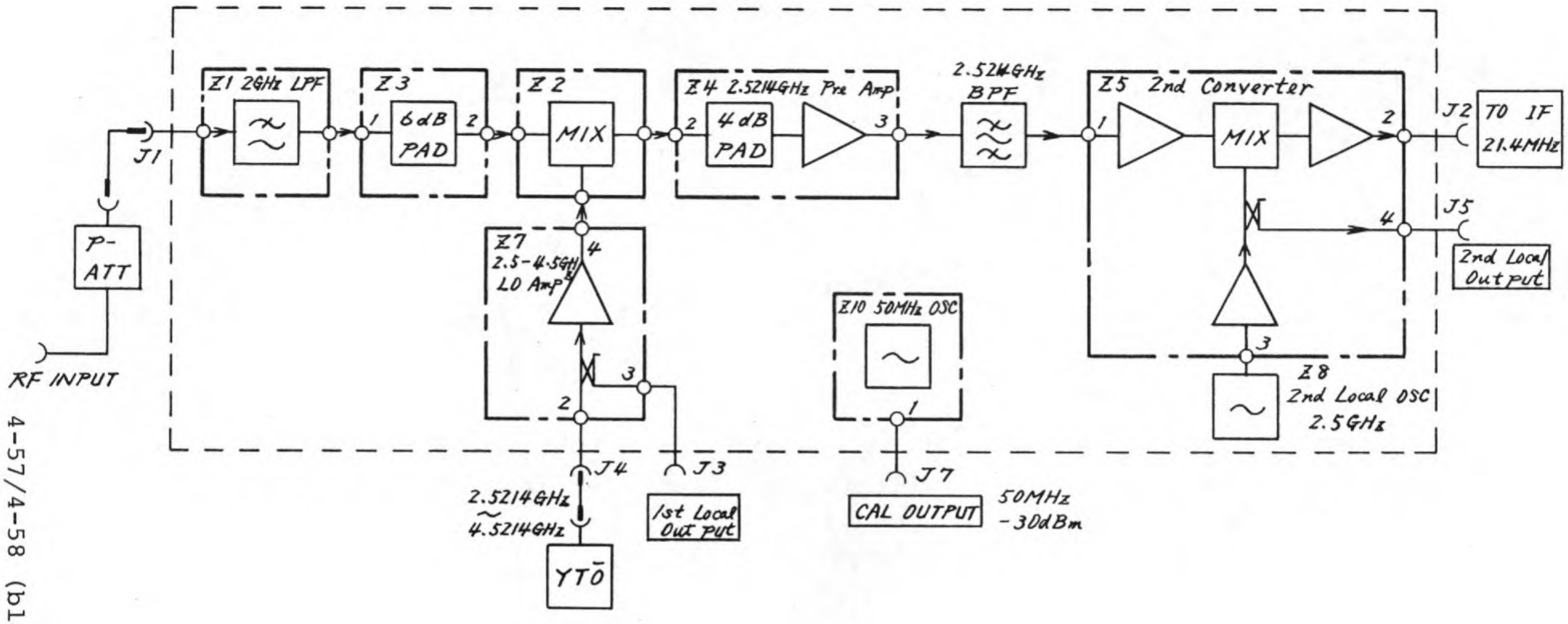
TITLE: YTO DRIVE Circuit Diagram

DRAWING No. 33W26569 2/2

5

ANRITSU CORP.

4-55/4-56

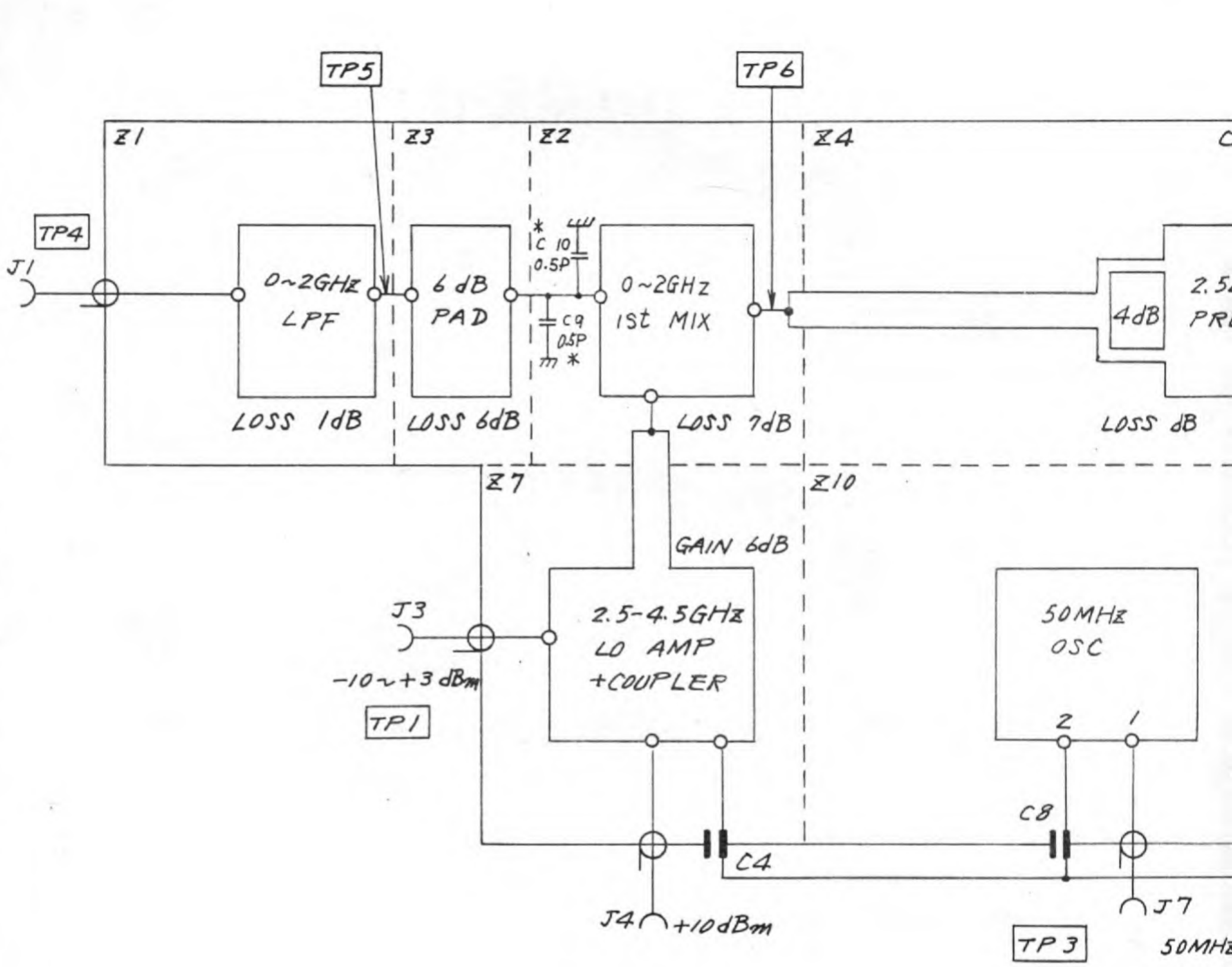


RF Block
Block Diagram

33W26562 1/1

APPLICATION

34Y83846



Parts List	34W85987

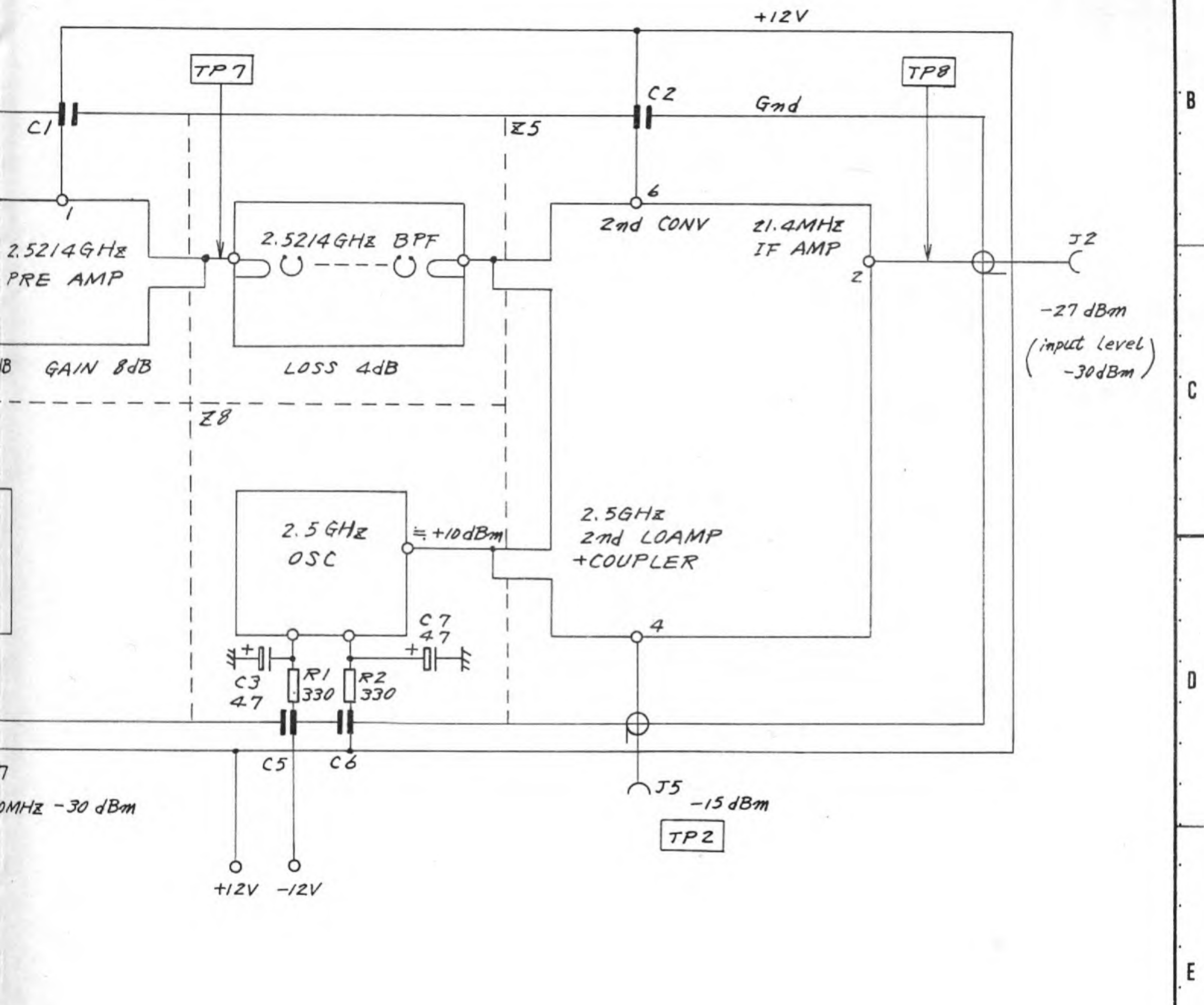
*Note: C9 and C10 are built only into the MS610A for adjustment use.

DEP

5 6 7 8

REVISIONS

A B C D E F



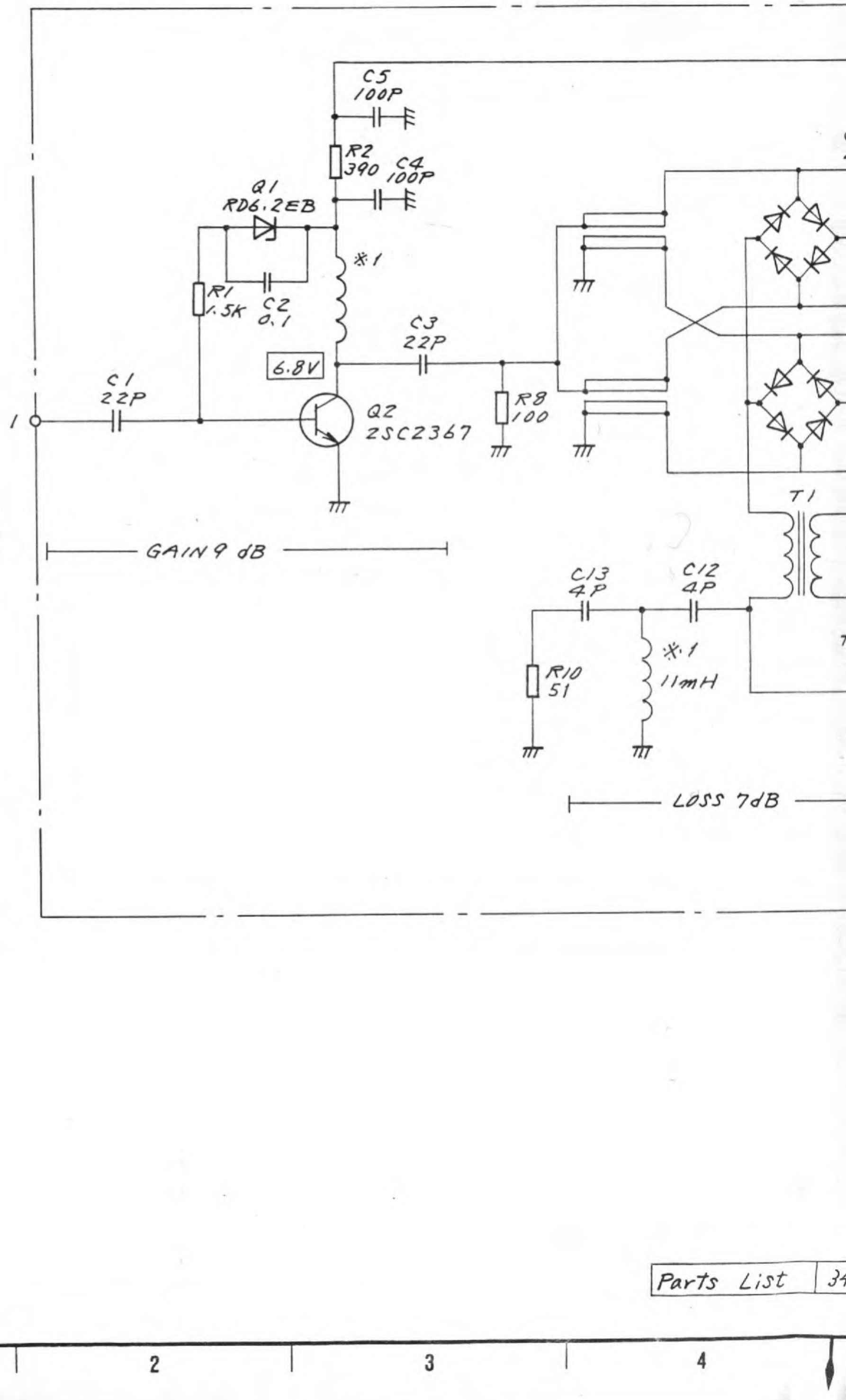
QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	16
APPROVED BY	DRAWN BY	:	
TITLE: RF CONV Circuit Diagram		DRAWING No. 33W26562 1/1	

5 6 ANRITSU CORP. 4-59/4-60

33W28092	1/1

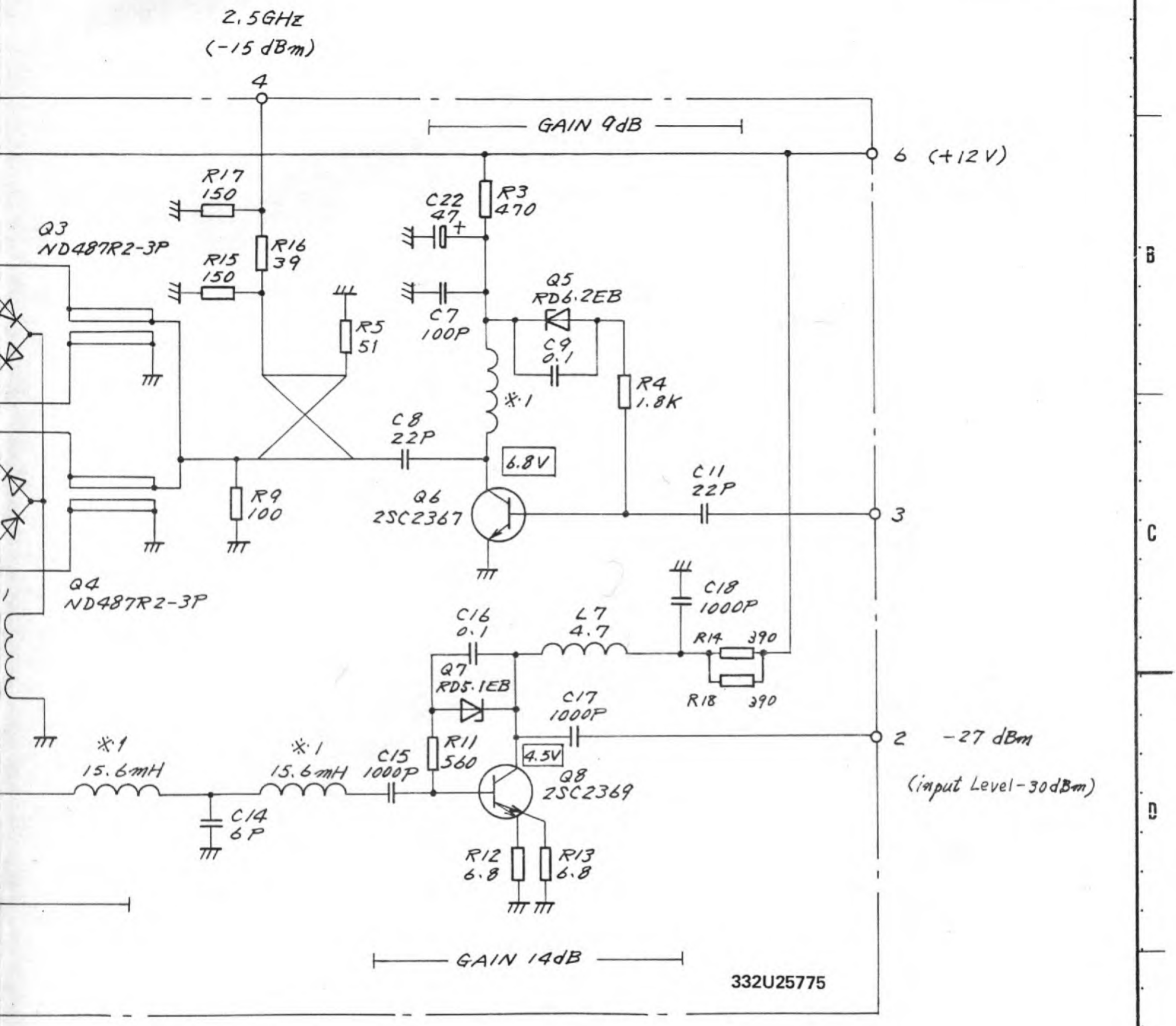
APPLICATION
34Y83846



DEP

Parts List	34

REVISIONS



*1 Printed Coil Pattern

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	
						17

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

34W89581

TITLE: 2nd Converter Circuit Diagram

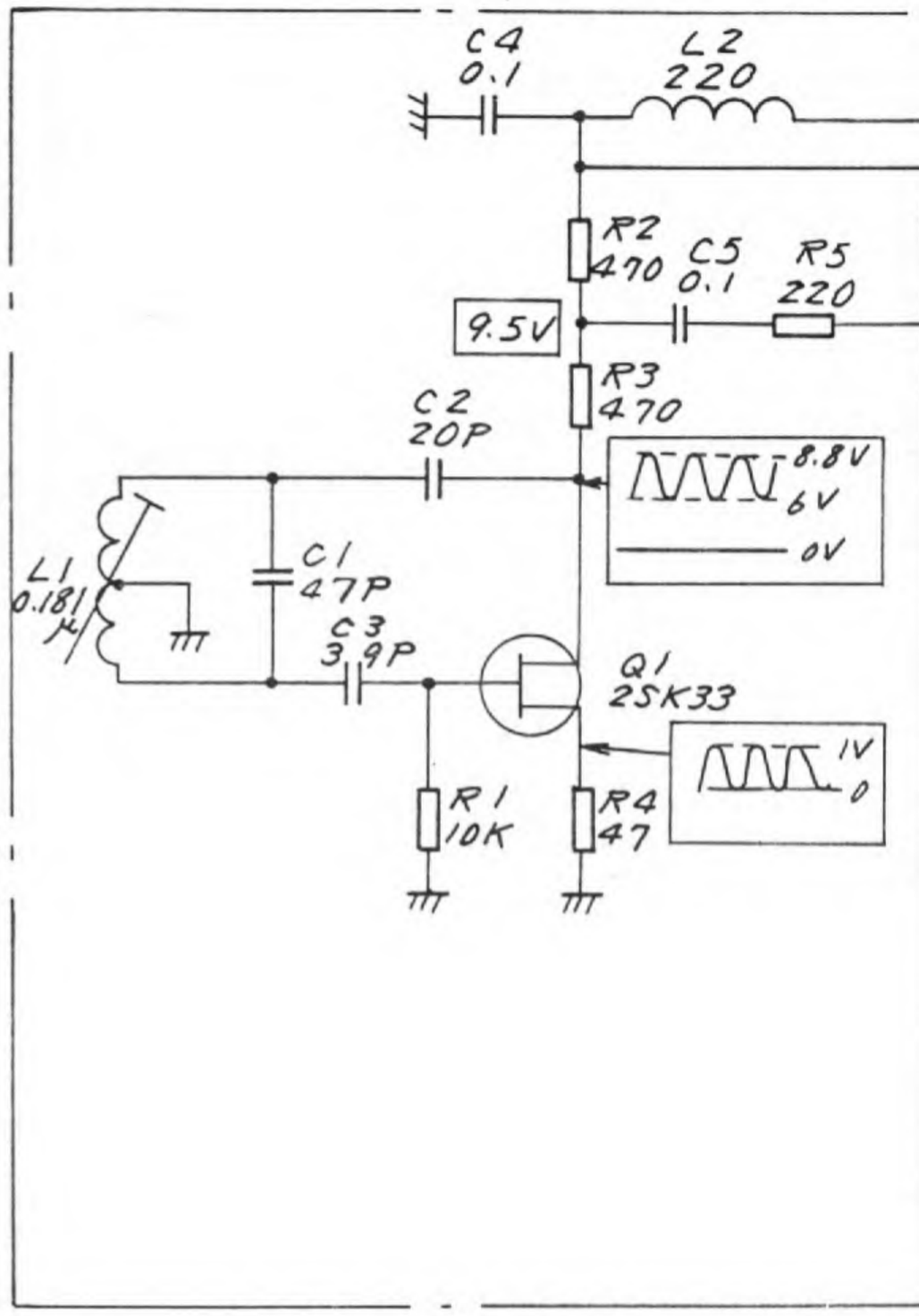
DRAWING No. 33W28092 1/1

ANRITSU CORP.

4-61/4-62

33W26564	1/1

APPLICATION
34Y83846



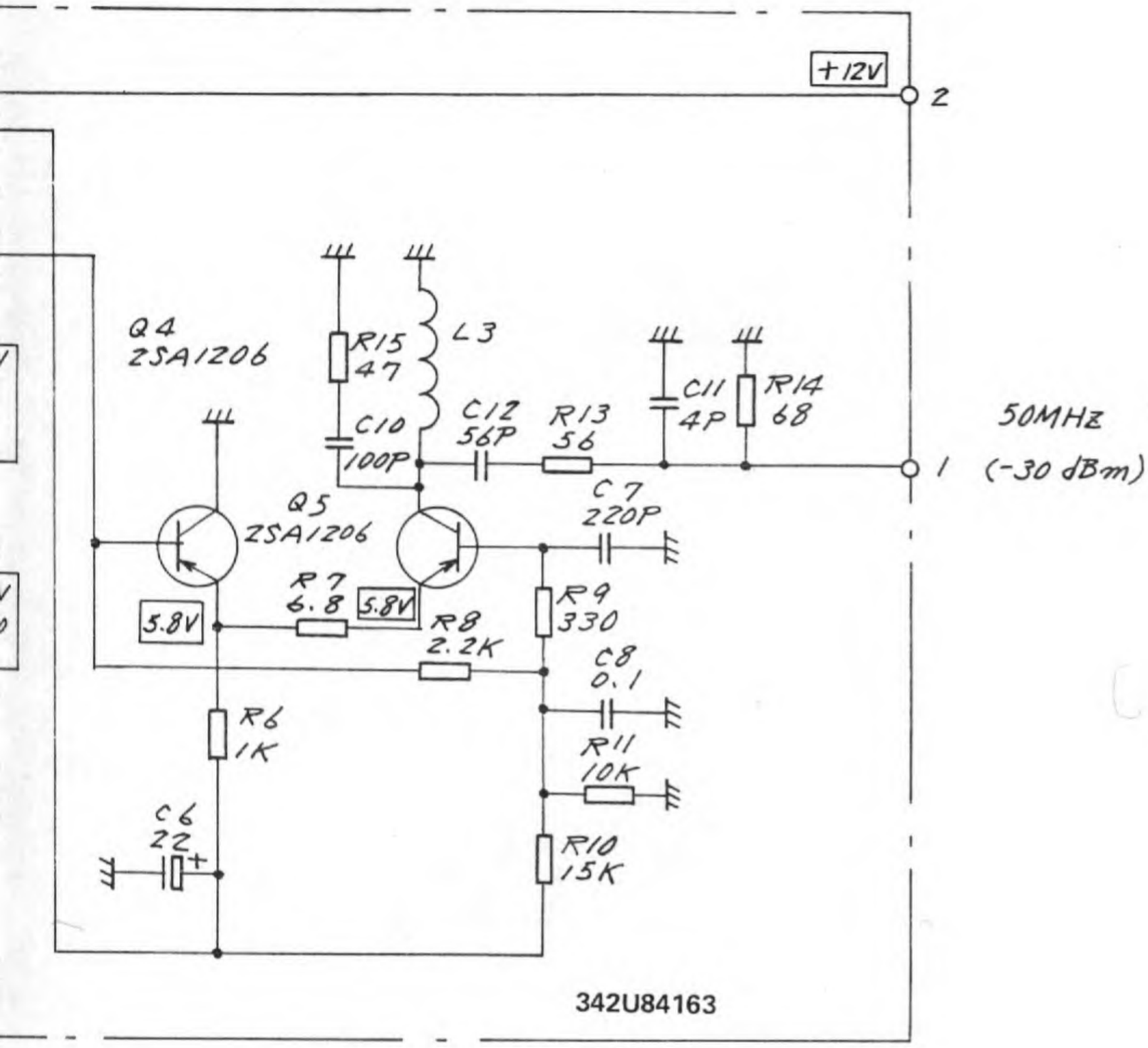
Parts List	34W85990

DEP

5 6 7 8

REVISIONS

A B C D E F



QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	

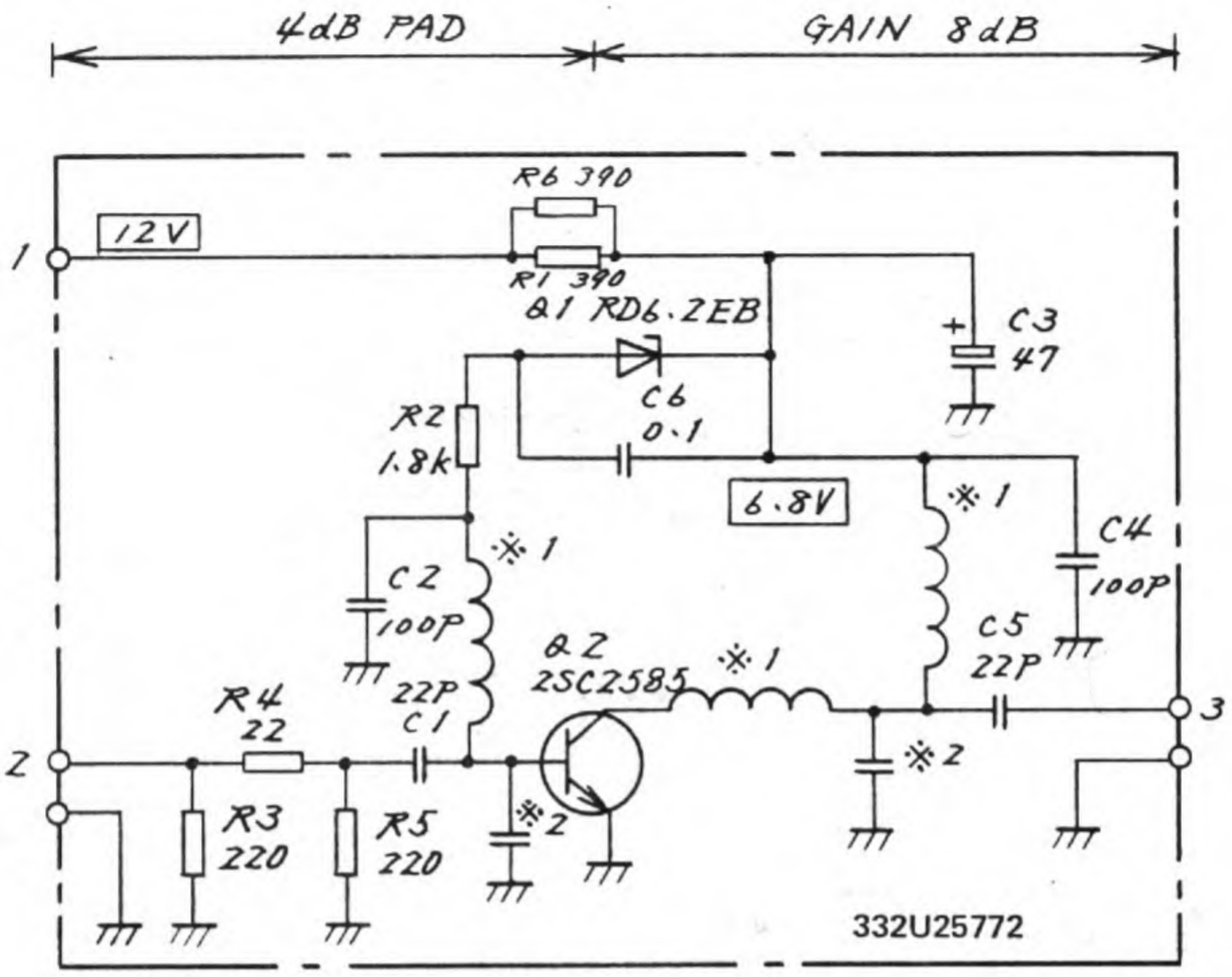
CHECKED BY	TRACED BY	SCALE	18
APPROVED BY	DRAWN BY	:	
TITLE: 50MHz OSC Circuit Diagram		DRAWING No. 33W26564 1/1	

5 6 ANRITSU CORP. 4-63/4-64

34W87923	1/1

APPLICATION
34Y83859

REVISIONS



※1 Printed Coil Pattern

※2 Printed Condenser Pattern

Parts List	34W89578

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	19
APPROVED BY	DRAWN BY	:	

DEP

TITLE 2.5214 GHz PRE AMP
Circuit Diagram

DRAWING No. 34W89579 1/1

No. D025·1985.08

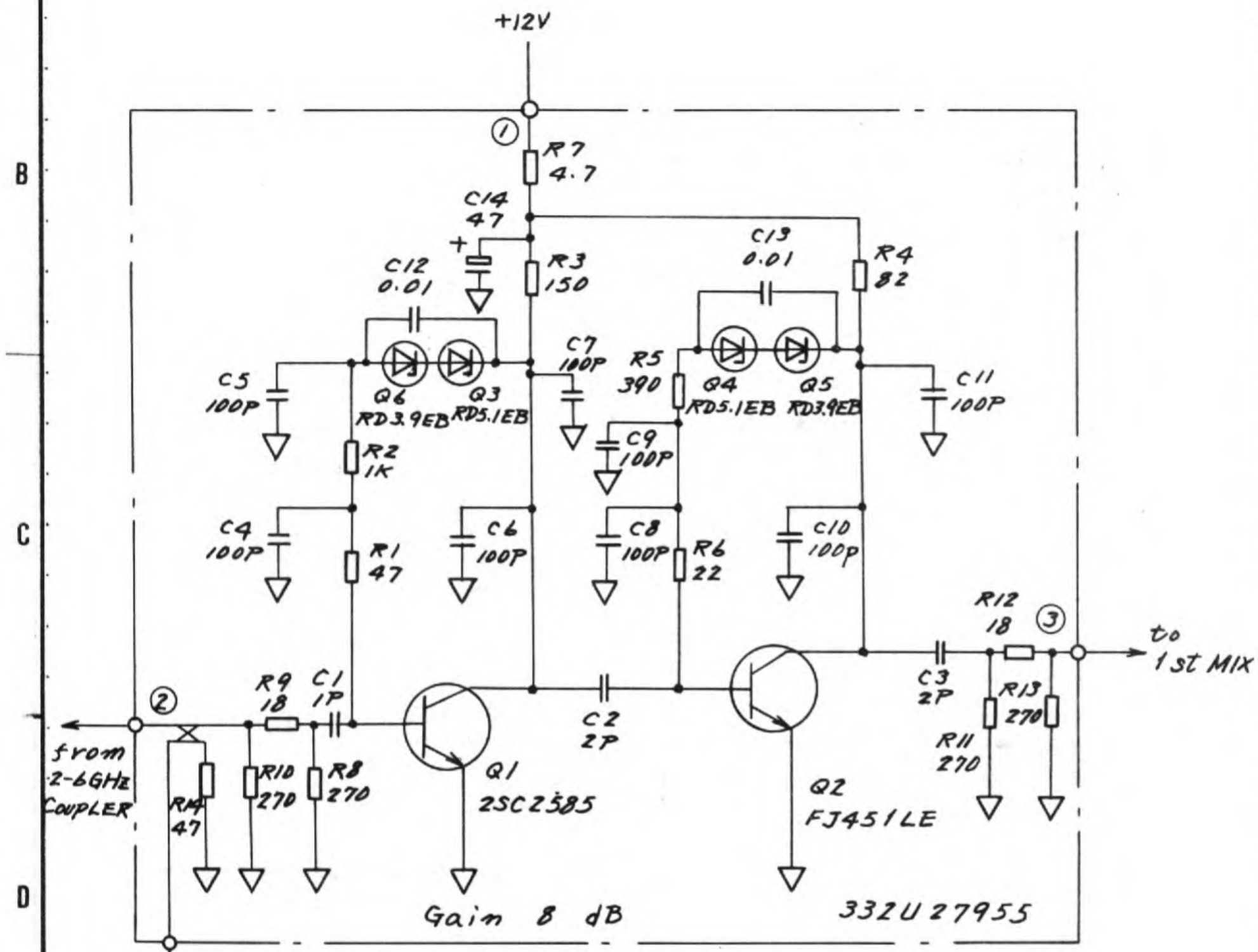
ANRITSU CORP.

4-65

34W89427 1/1

APPLICATION

REVISIONS



Parts List 34W89426

20

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	NOTE

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

DEP

TITLE 2.5-4.5 GHz LO-AMP Circuit Diagram

DRAWING No. 34W89427 1/1

No. D025·1985.08

ANRITSU CORP.

4-66

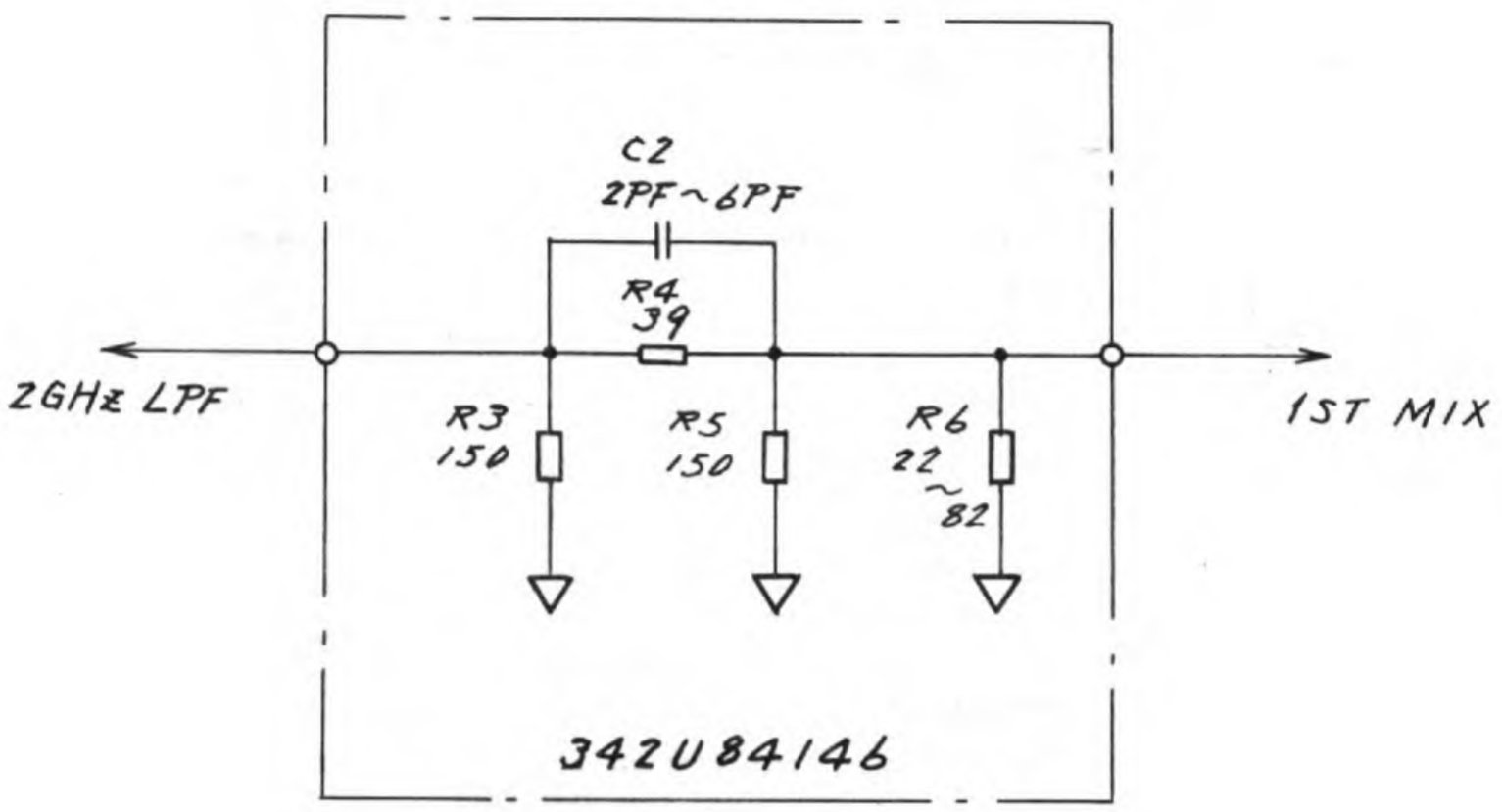
34W89429	1/1

APPLICATION

REVISIONS

A

B



C

D

Parts List	34W89428

E

21

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	NOTE

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

DEP

TITLE: 6dB PAD Circuit Diagram

DRAWING No.: 34W89429 1/1

No. D025-1985.08

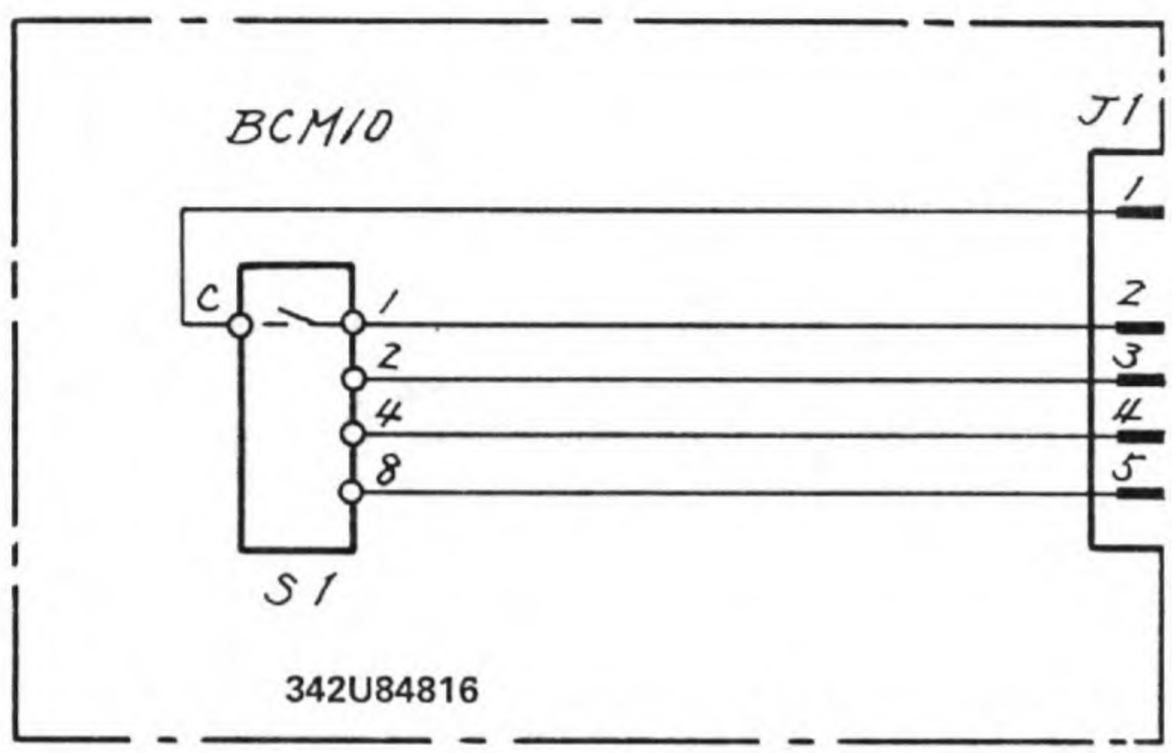
ANRITSU CORP.

4-67

34W85998	1/1

APPLICATION
34Y86001

REVISIONS



Parts List	34W86018

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	22
APPROVED BY	DRAWN BY	:	

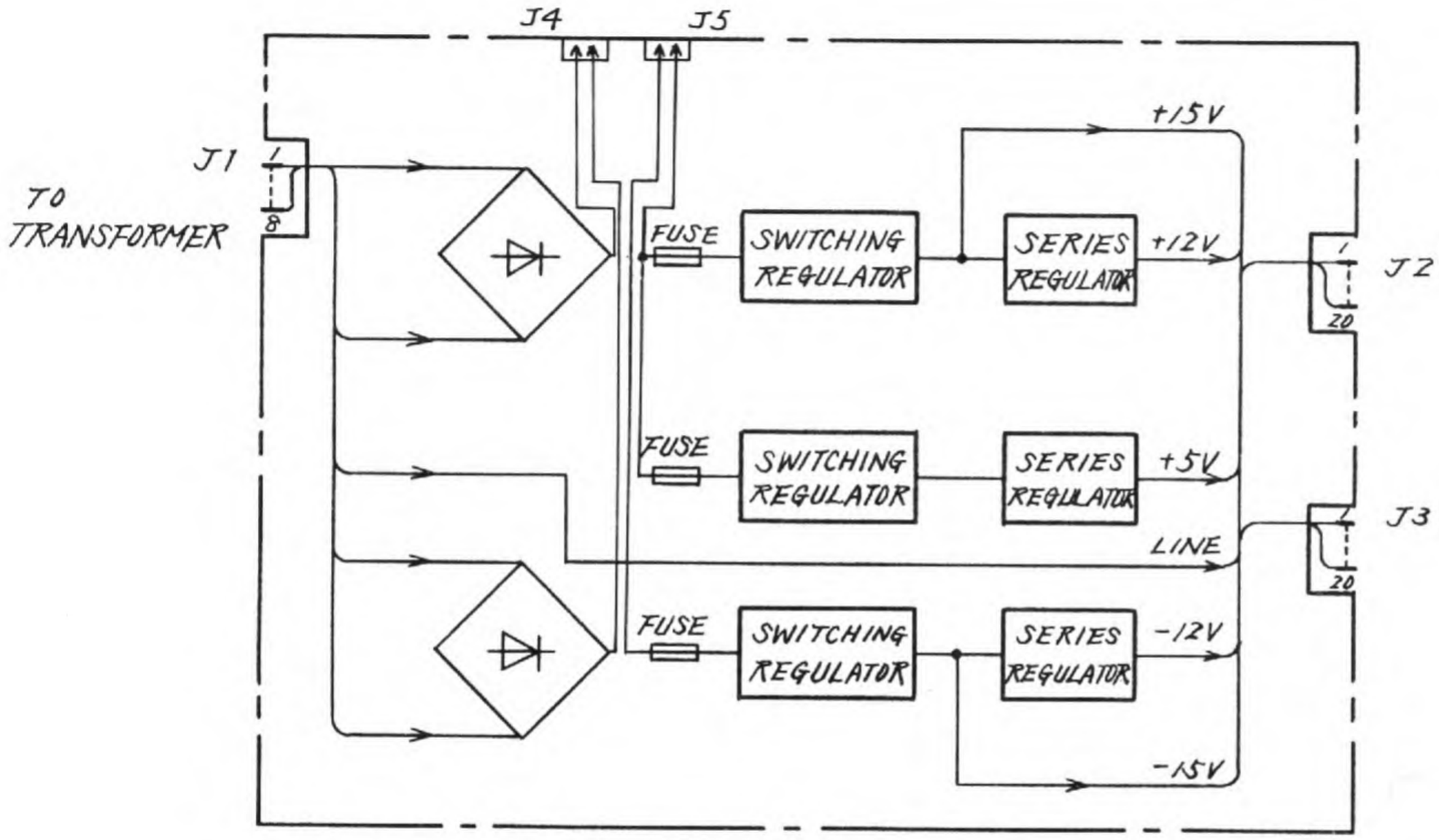
DEP

TITLE: DIGITAL SW Circuit Diagram

DRAWING No.: 34W85998 1/1

ANRITSU CORP.

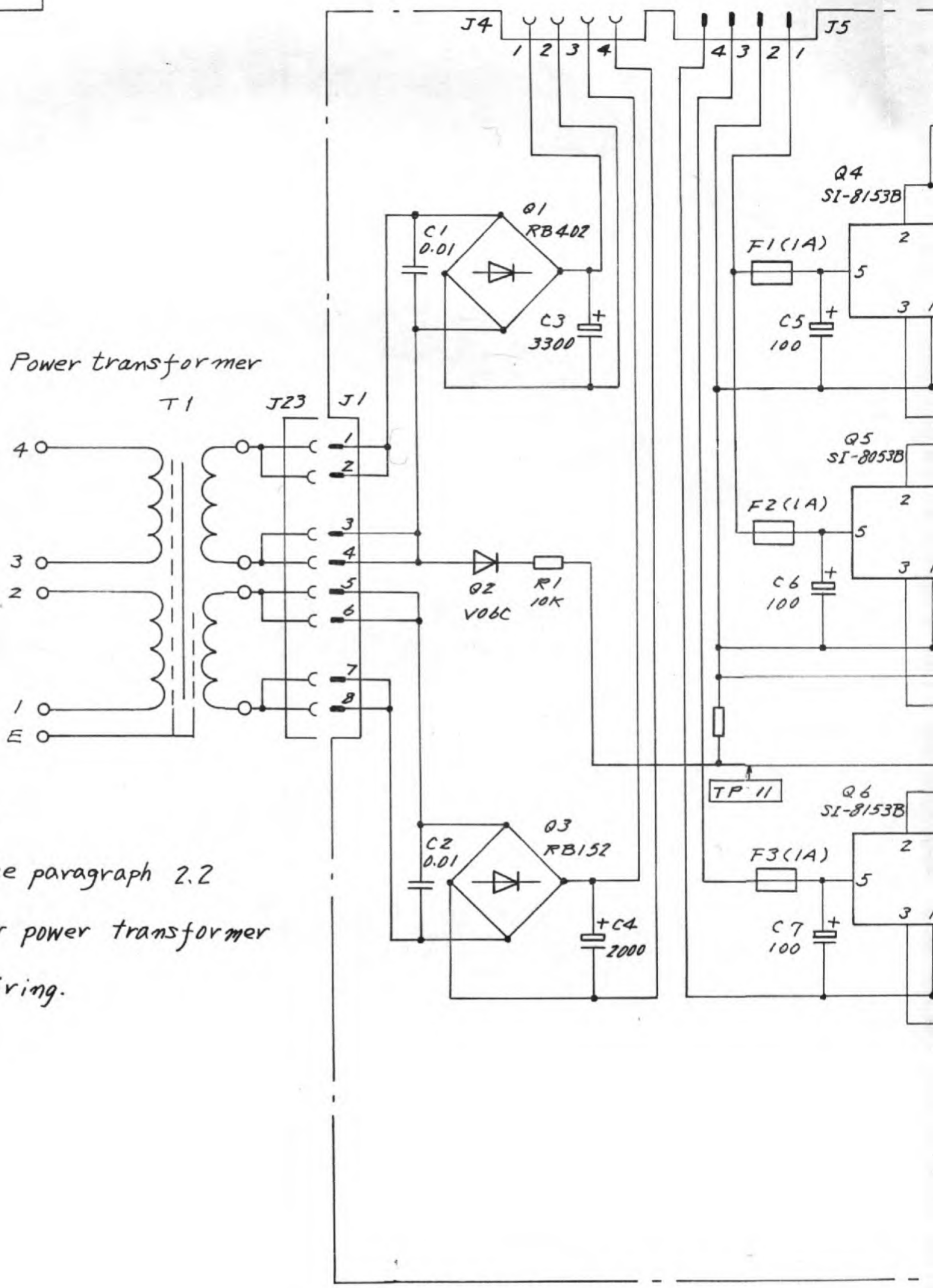
4-68



POWER SUPPY
Block Diagram

33W27379 1/1

APPLICATION



Note:

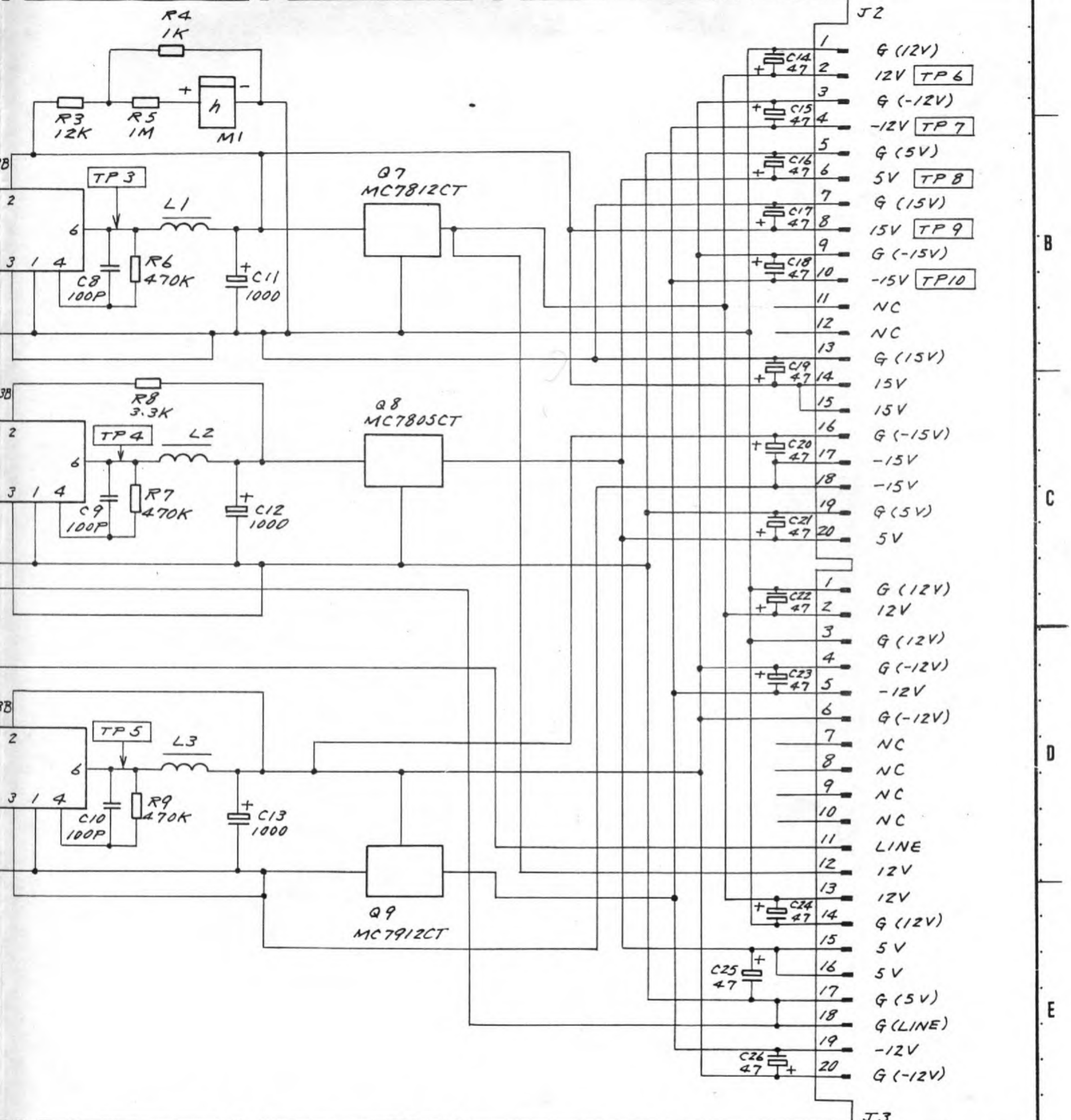
See paragraph 2.2 for power transformer wiring.

Parts List 3

DEP

No. D023-1985.08

REVISIONS



QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	24
APPROVED BY	DRAWN BY	:	

TITLE: Z7 POWER SUPPLY Circuit Diagram

DRAWING No. 33W27379 1/1

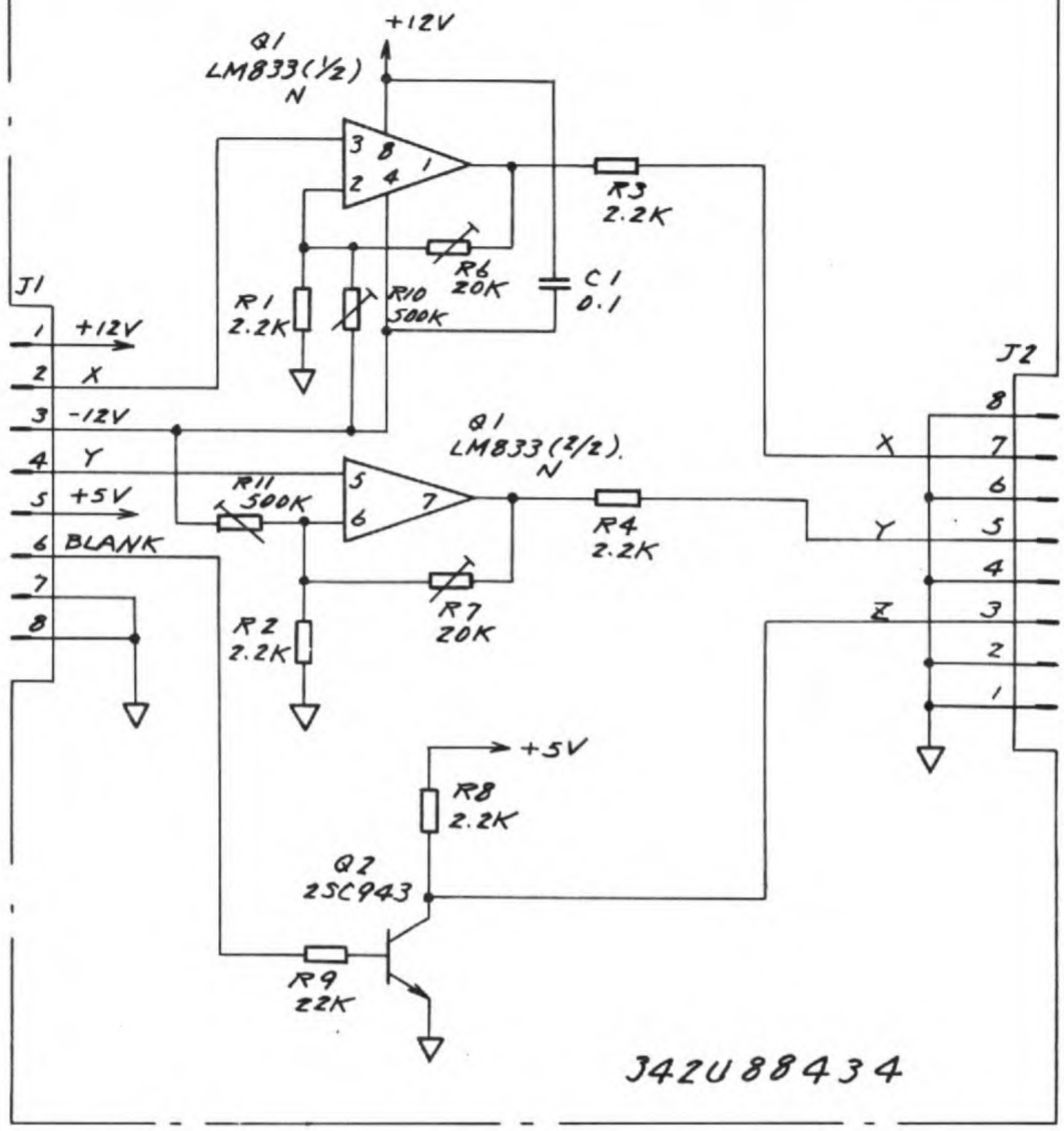
34W87893

ANRITSU CORP.

4-71/4-72

34W89300 1/1

APPLICATION	REVISIONS



Parts List 34W89299

25

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH	NOTE

CHECKED BY	TRACED BY	SCALE	
APPROVED BY	DRAWN BY	:	

DEP

TITLE: XYZ-OUTPUT Circuit Diagram

DRAWING No. 34W89300 1/1

No. D025·1985.08

ANRITSU CORP.

4-73/4-74

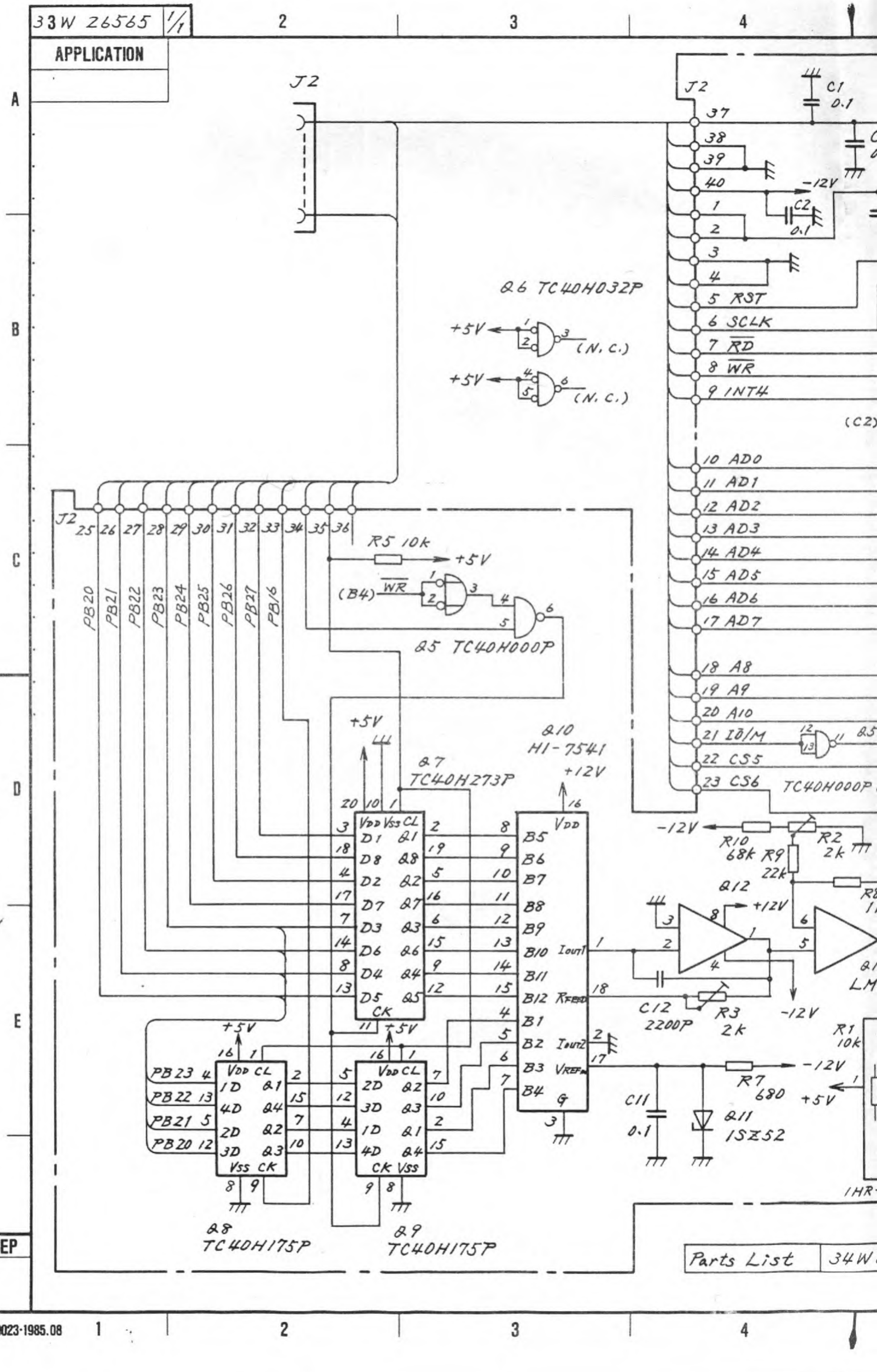
33W 26565	1/1

APPLICATION

DEP

Parts List | 34W

No. D023-1985.08



REVISIONS

+12V → Q5-7, Q6-7

C4 0.1, C3 0.1, C5 0.1, C6 0.1

Q5-14, Q6-14

+5V

C7 0.1, C8 0.1, C9 0.1, C10 0.1

Q1 μPD7210

4	RST	T/R3	5	
3	CLK			
9	$\overline{RD}$	DIO8	35	
10	$\overline{WR}$	DIO7	34	
11	$\overline{INT}$	DIO6	33	
20	GND	DIO5	32	
6	DMA	DIO4	31	
7	DMA	DIO3	30	
40	Vcc	DIO2	27	
12	D0	DIO1	28	
13	D1			
14	D2	T/R1	1	
15	D3			
16	D4			
17	D5	SRQ	27	
18	D6	ATN	26	
19	D7	EOI	39	
8	$\overline{CS}$	DAV	36	
21	RS0	NRFD	37	
22	RS1	NRAC	38	
23	RS2	IFC	24	
2	T/R2	REN	25	

RH 10k, +5V

Q5 8, 9, 10 — TC40H000P

(C2) $\overline{WR}$

+5V

Q3 SN75160AN

11	PE	Vcc	20
12	D8	B8	9
13	D7	B7	8
14	D6	B6	7
15	D5	B5	6
16	D4	B4	5
17	D3	B3	4
18	D2	B2	3
19	D1	B1	2
	TE	GND	1

10

+5V

Q4 SN75161AN

1	TE	Vcc	20
27	SRQ		12
26	ATN		13
39	EOI		14
36	DAV		15
37	NRFD		16
38	NDAC		17
24	IFC		18
25	REN		19
10	DC	GND	11

+5V

J1

16	9
15	8
14	7
13	6
4	5
3	4
2	3
1	2
12	
18	
19	
20	
10	9
11	8
5	7
6	6
7	5
8	4
9	3
17	2
21	
22	
23	
24	

Q5, Q6 12, 13, 11 — Q6 9, 10, 8 — TC40H032P

Q2 TC40H367P S1

16		VDD			
AD0	3	1Y	1A	2	(A1) 15
AD1	13	6Y	6A	14	(A2) 14
AD2	5	2Y	2A	4	(A3) 13
AD3	11	5Y	5A	12	(A4) 12
AD4	7	3Y	3A	6	(A5) 11
AD5	9	4Y	4A	10	9, 10, 16
	1	$\overline{G1}$			
	15	$\overline{G2}$			
		Vss			
	8				

DYS-8

2	
3	
4	
5	
6	
1, 7, 8	

R8 1k, 7 — Q12 LM833

7	(A1)
6	(A2)
5	(A3)
4	(A4)
3	(A5)
2	

1HR-6-103JA

J3: G, 1

4W85991

QTY	ITEM	PART No.	DESCRIPTION	MATERIAL	FINISH

CHECKED BY	TRACED BY	SCALE	26
APPROVED BY	DRAWN BY	:	

TITLE: GP-IB Circuit Diagram(Option 01)

DRAWING No. 33W 26565 1/1

ANRITSU CORP.

4-75/4-76

SECTION 5

ADJUSTMENT

5.1 Introduction

This section describes how to adjust the test instrument, after repairs have been completed, to maintain the instrument performance within the specifications.

When two or more units are adjusted, the adjustments must be made in the sequence shown below. If this sequence is reversed, previous adjustments will be disturbed.

Step	Adjustment
1	POWER SUPPLY Z7 Adjustment
2	CRT DRIVE Z12 Adjustment
3	RF Unit: RF Conv. Z2, YTO DRIVE Z5 Adjustment
	3.1 50 MHz Osc (CAL OUTPUT) Z2-Z10 Adjustment
	3.2 2.5 GHz Osc (2nd LOCAL OUTPUT) Z2-Z8 Adjustment
	3.3 2.5214 GHz BPF Adjustment
	3.4 1st Mixer Z2-Z2, Z2 Unit Adjustment
4	IF Unit Z3 Adjustment
5	Overall Adjustment
	5.1 Horizontal Display Adjustment
	5.2 Frequency Display Adjustment
	5.3 Vertical Display Adjustment
	5.4 Overall Gain Adjustment
	5.5 XYZ Output Adjustment

Adjust only the necessary items. If correctly calibrated equipment required for adjustment is not available, do not attempt adjustment.

CAUTION

Before disassembling/reassembling the MS610B/J/J1, turn off the power switch on the front panel and disconnect the power supply cord from the ac outlet.

5.2 Internal View Under Covers

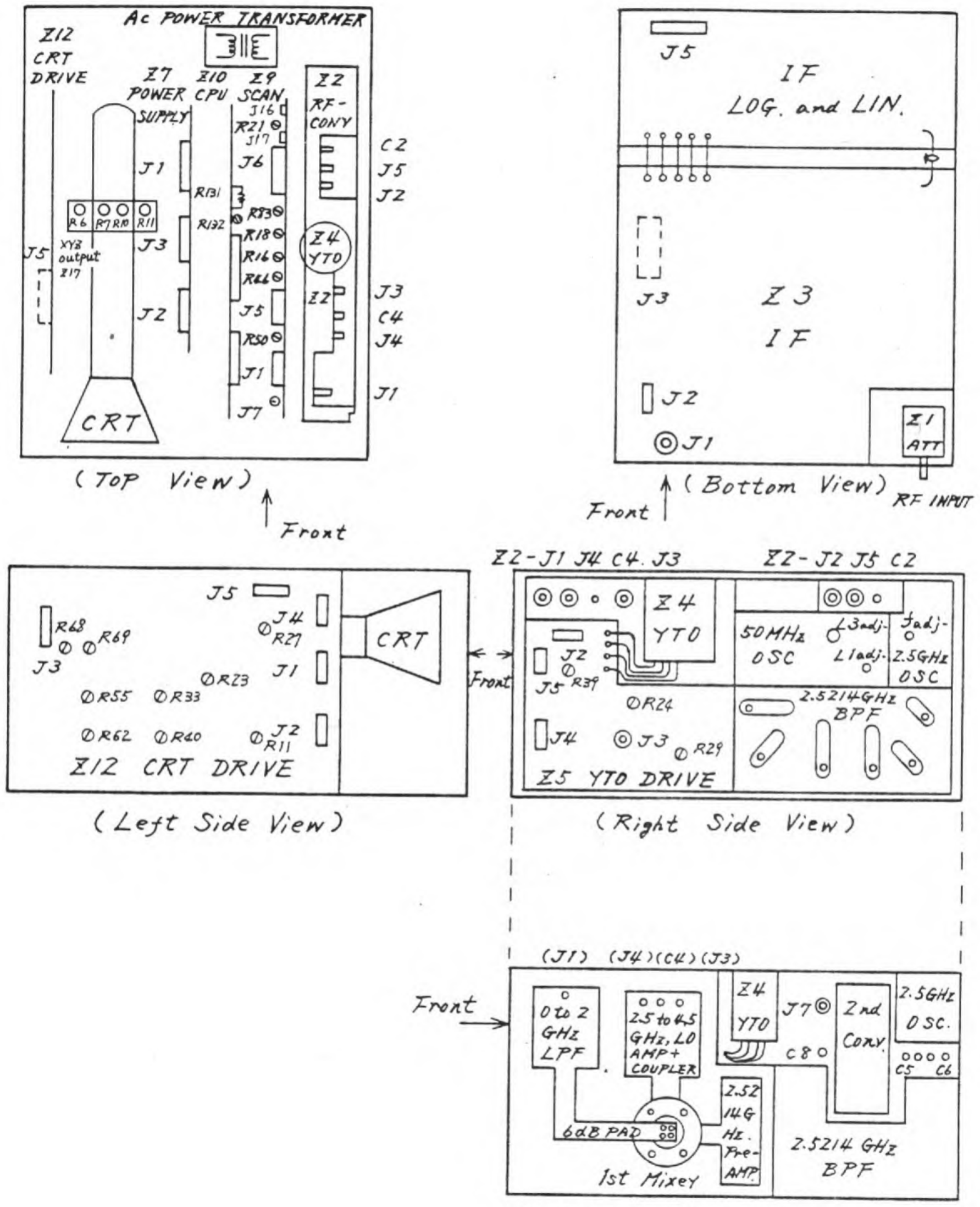


Fig. 5-1 Internal Views Under Outside Covers

5.3 Power Supply Secondary Fuse Replacement

If the dc power supply circuit is shorted to ground or overloaded, the power supply secondary fuse will blow.

Current rating of the fuses are shown below.

+15 V (+12 V)	Fuse 1	1 A
+5 V	Fuse 2	1 A
-15 V (-12 V)	Fuse 3	1 A

Replace fuses as follows:

Step	Procedure
1	Disconnect the Z7-J1, J2 and J3 connectors.
2	Loosen the two M3 screws.
3	Lift the angle (hatched in Fig. 5-2) with the Z7 POWER SUPPLY unit. The fuses are on the Z7 PC board.

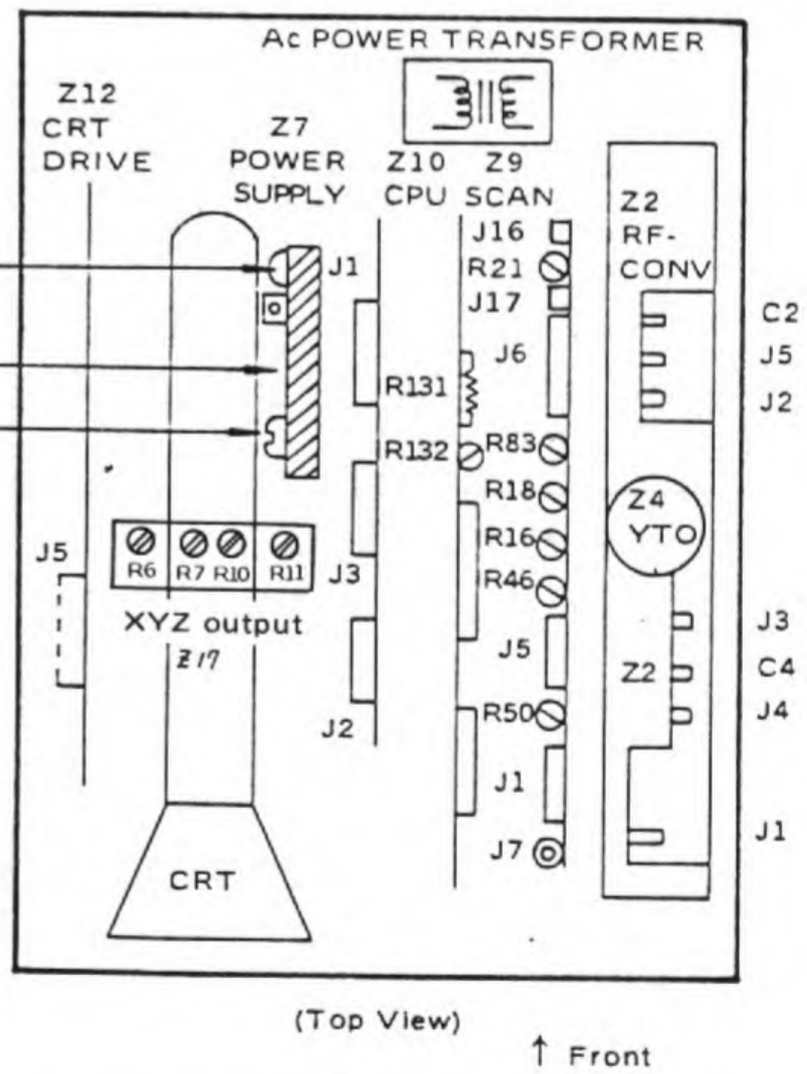


Fig. 5-2 Secondary Fuse Replacement

5.4 Equipment Required for Adjustment

Table 5-1 Equipment Required for Adjustment

No.	Required Equipment	Performance
	Signal Generator:	
1	MG724A1	1.7 to 2.3 GHz, 50 Ω
2	MG655A	100 kHz to 1.3 GHz, 50 Ω
3	MG443B	10 Hz to 30 MHz, 50 Ω/75 Ω
	Spectrum Analyzer:	
4	MS68B	10 kHz to 4.4 GHz, 50 Ω
5	MS420B	10 Hz to 30 MHz, 75 Ω
6	Digital Voltmeter (DVM)	±15 V, 10 mV resolution
	Frequency Counter:	
7	MF76A	10 Hz to 18 GHz
8	Low Pass Filter	fc = 100 kHz to 2 GHz
9	Tracking Generator: MH680B	100 kHz to 2 GHz
10	Power Meter	50 Ω/75 Ω, 100 kHz to 2 GHz
11	Oscilloscope	
12	50 → 75 Ω Impedance Converter	100 kHz to 2 GHz

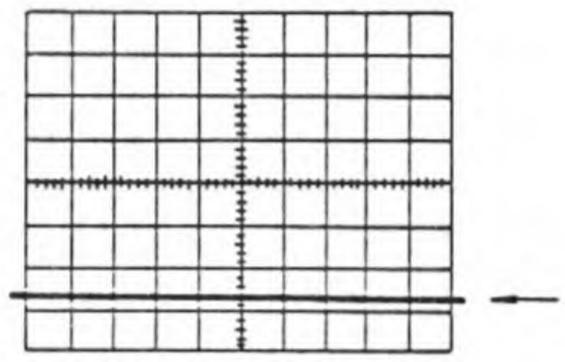
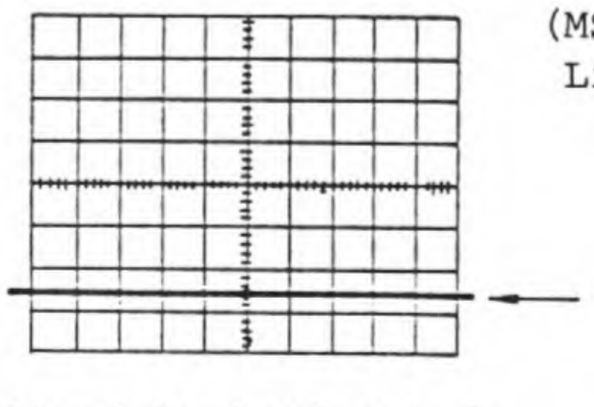
5.5 Adjustment Procedure

5.5.1 POWER SUPPLY Z7 adjustment

No adjustment is necessary. Confirm the dc voltages below.

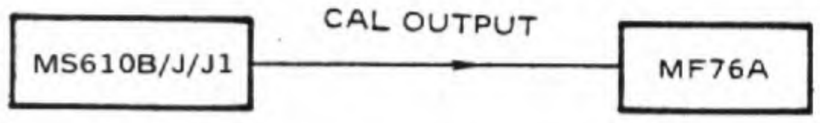
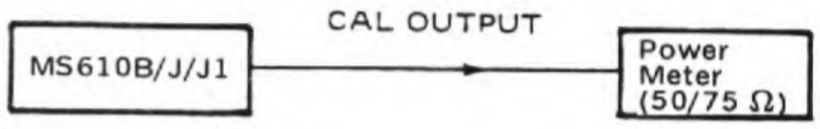
Z7-J2-#1	GND	#7	GND
2	+12 V	8	+15 V
3	GND	9	GND
4	-12 V	10	-15 V
5	GND		
6	+5 V		

5.5.2 CRT DRIVE Z12 adjustment

Item	Adj. Position	Adjustment	Setting
Intensity Adj.	Z12-R11	Screen display disappears	(MS610B/J/J1) INTENSITY 12 o'clock
Geometry Adj.	Z12-R69	 Straight horizontal bottom line (Not bending)	(MS610B/J) Linear scale
Astigma-tism Adj.	Z12-R68	Best focus	
Focus Adj.	Z12-R23	Best focus	
Trace-Rota-tion Adj.	Z12-R27	 Straight horizontal bottom line (Not inclined)	(MS610B/J/J1) Linear Scale

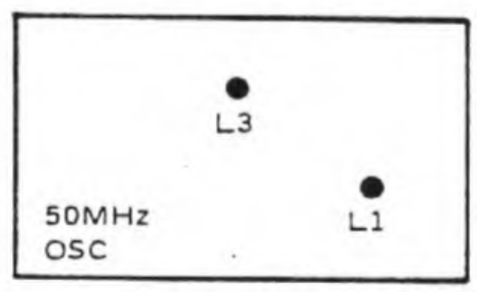
5.5.3 RF Unit: RF CONV. Z2, YTO DRIVE Z5 adjustments

(1) 50 MHz OSC (CAL OUTPUT) Z2-Z10 adjustment

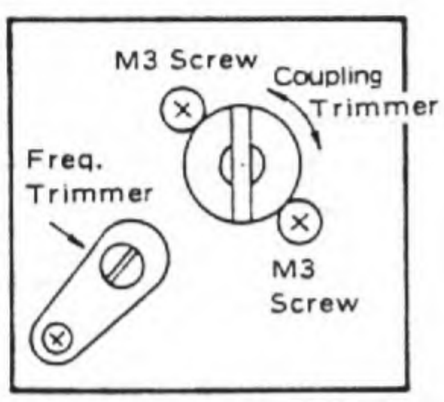
Item	Adj. Position	Adjustment	Setting
Frequency Adj.	Z2-Z10-L1	50.000 MHz	
Lavel Adj.	Z2-Z10-L3	-30 dBm	

Note:

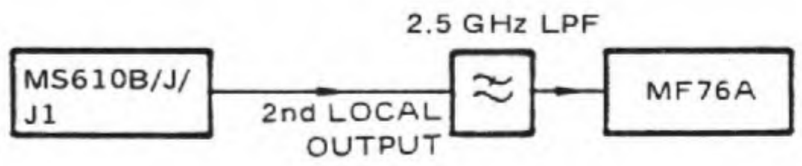
Adjustments can be made through the hole in the shielded case without opening the case.



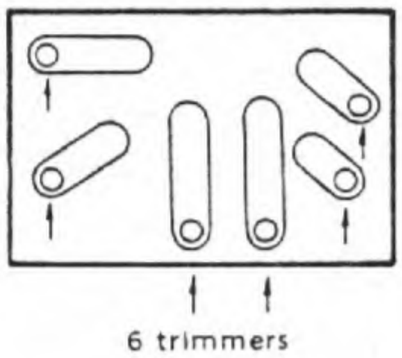
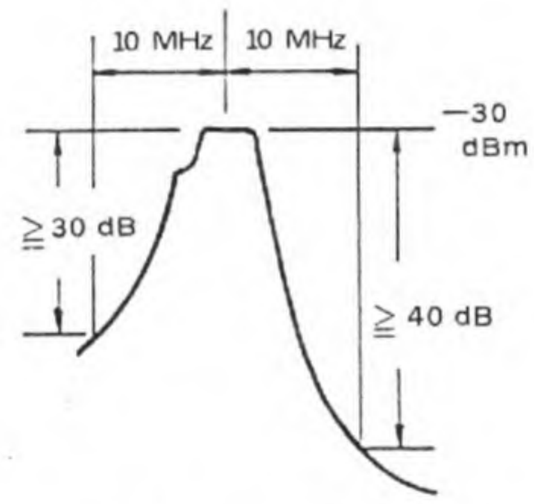
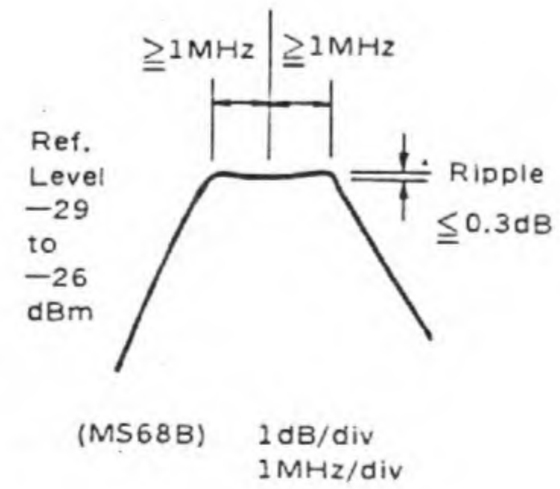
(2) 2.5 GHz OSC (2nd LOCAL OUTPUT) Z2-Z8 adjustment

Item	Adj. Position	Adjustment	Setting
Prepara-tion			Open the 2.5 GHz Osc case cover.
Coupling Adj.	Coupling trimmer		

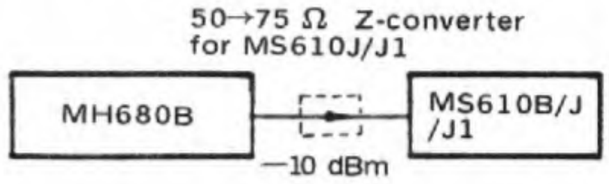
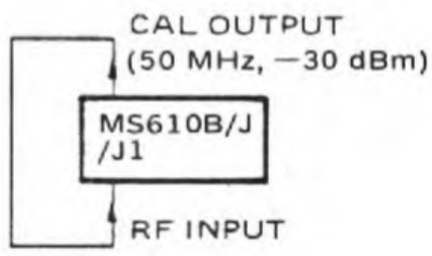
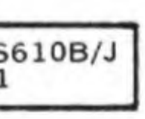
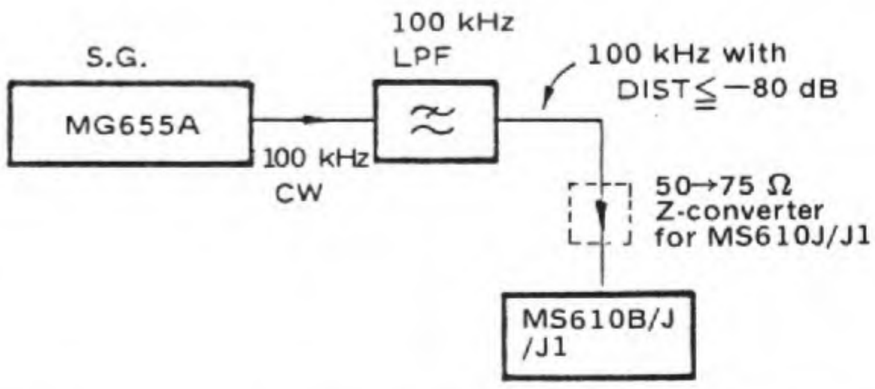
Step	Procedure
1	Loosen the M3 screws.
2	Turn the coupling trimmer clockwise to stop the oscillation.
3	Then, turn the trimmer counter-clockwise to restart the oscillation.
4	Turn the trimmer clock-wise to decrease the frequency by 5 MHz.
5	Tighten down the M3 screws.

Frequency Adj.	Frequency trimmer	2.500000 GHz	

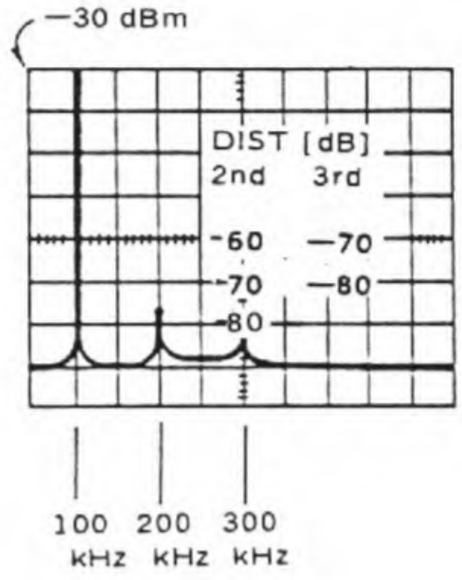
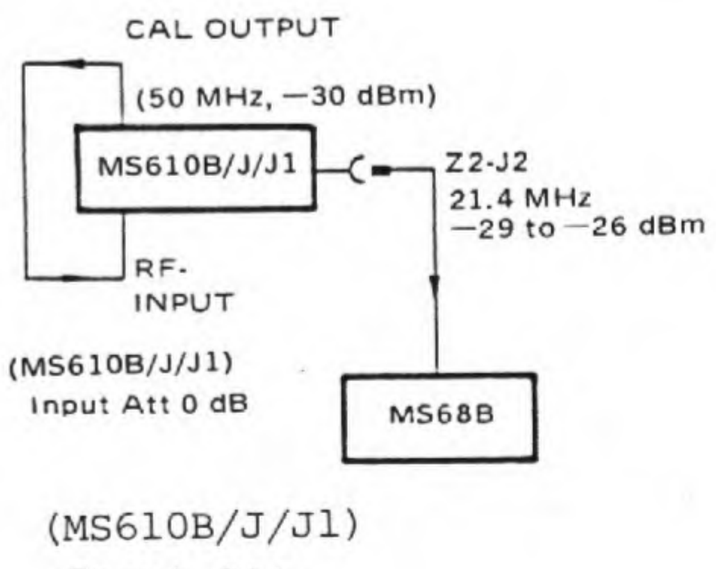
(3) 2.5214 GHz BPF adjustment

Item	Adj. Position	Adjustment	Setting
BPF Slope Adj.		① 21.4 MHz  (MS68B) 10 dB/div 5 MHz/div	(MS610B/J/J1) (MS68B) Center Freq. Center Freq. 50 MHz 21.4 MHz Sweep Time Scan Time 2 s 1 ms/div Ref. Level Ref. Level -30 dBm -30 dBm Freq. Span Scale 20 MHz 10 dB/div or 1 dB/div Scan Width 5 MHz/div or 1 MHz/div
	Adjust ① → ② (not ② → ①)		
BPF Top Adj.		② 21.4 MHz  (MS68B) 1dB/div 1MHz/div	

(4) 1st Mixer Z2-Z2, Z2 Unit adjustment

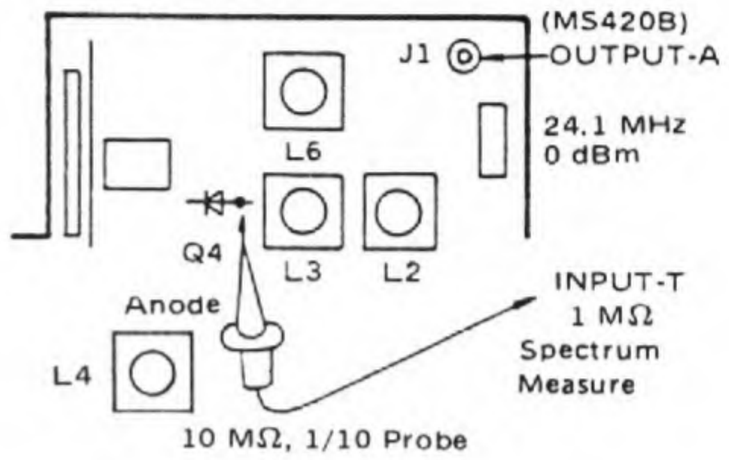
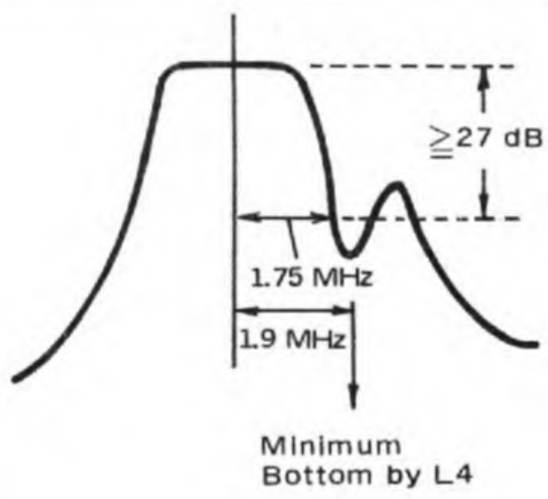
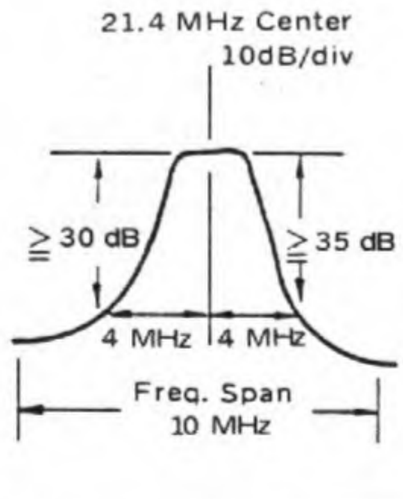
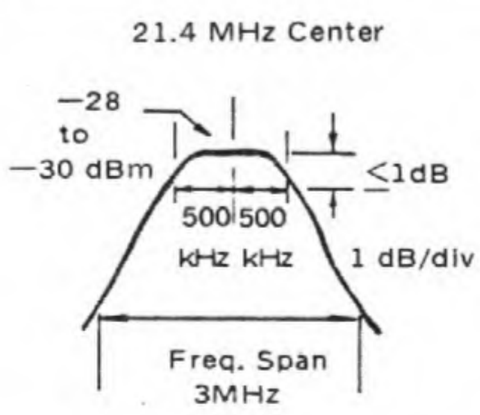
Item	Adj. Position	Adjustment	Setting
RF unit Freq.- Level Charac- teristic Check		Screen Display: ≦±1.2 dB at 100 kHz to 1.5 GHz (Reference 50 MHz) +1.5 to -2.5 dB at 1.5 to 2 GHz	Tracking Generator  (MS610B/J) Freq. Span 2 GHz Scale 2 dB/div Ref. Level 0 dBm Input Att. 0 to 50 dB (ref. level varies.)
1st Mixer Balance Adj. Adjust ① → ② (not ② → ①)	① Gain Adj. (on front panel)	Screen display -30 dBm	 (MS610B/J/J1) Center Freq. 50 MHz Freq. Span 10 MHz Ref. Level -10 dBm Input Att. 0 dB
② 1st Mixer Balance Adj. 4 screws		Best Zero ≦-15 dBm	 no input (MS610B/J/J1) Center Freq. 0 MHz Freq. Span 10 MHz Ref. Level -10 dBm Input Att. 0 dB
2nd, 3rd Harmonic Distor- tion -100 kHz Check			

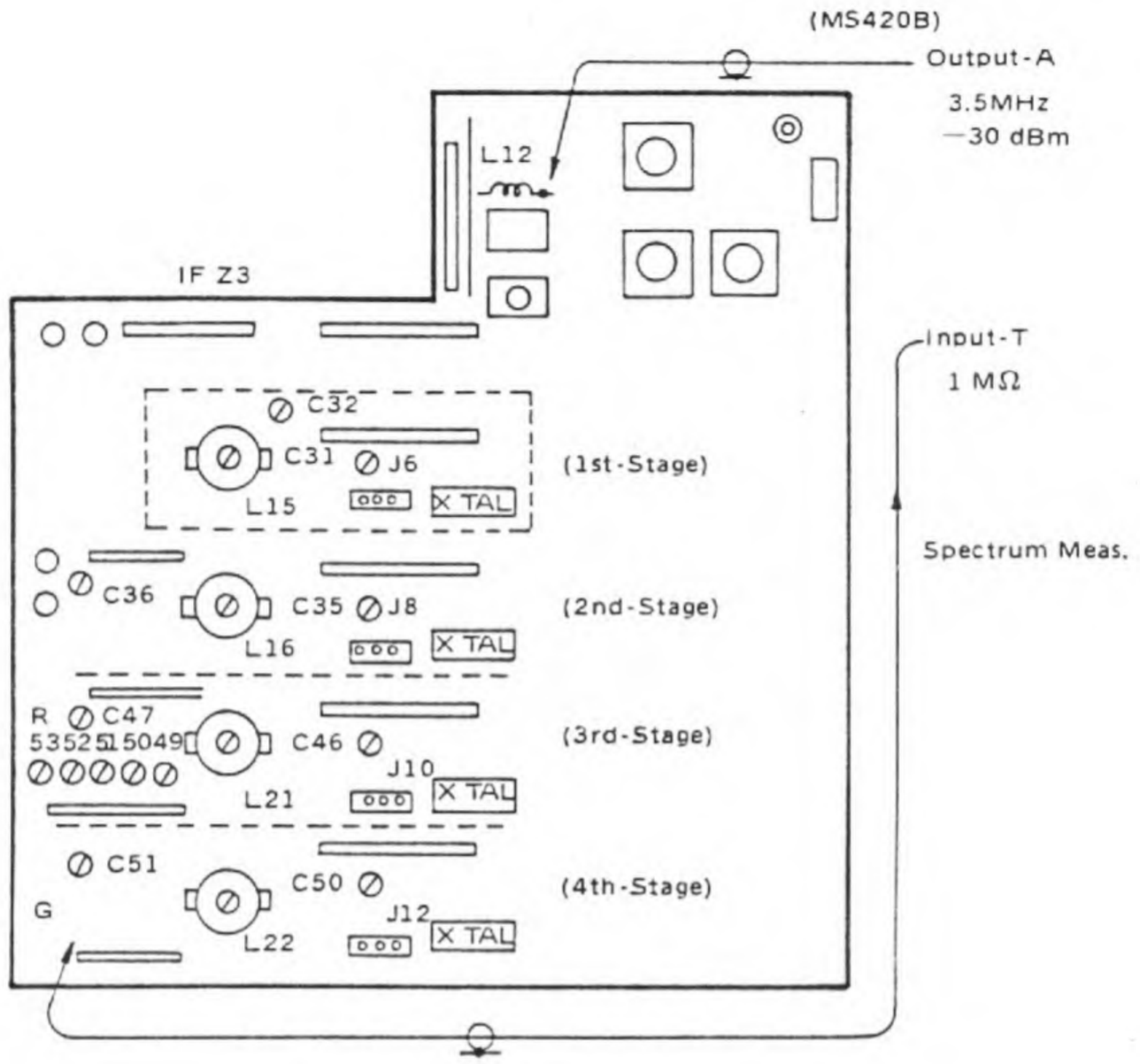
(4) (continued)

Item	Adj. Position	Adjustment	Setting
2nd, 3rd Hormonic Distortion : 100 kHz to 1 GHz			(MS610B/J/J1) Center Freq 300 kHz Freq. Span 500 kHz Input Att. 0 dB Ref. Level -30 dBm Step Procedure 1 Receive -30 dBm, and adjust the SG level to set the display on the reference level scale. 2 Change the SG level by +10 dB. (-20 dBm) 3 Then confirm: 2nd harmonics ≦-70 dB 3rd harmonics ≦-70 dB 
2nd, 3rd Hormonic Distortion : 100 kHz to 1 GHz			(Similar to at 100 kHz except that LPF output dist. is ≦-90 dB at frequency range of 5 to 800 MHz.)
RF Unit Gain		Gain +1 to +4 dB approximately $\left(\frac{\text{-29 to -26 dBm}}{\text{-30 dBm}}\right)$	 (MS610B/J/J1) Input Att. 0 dB

5.5.4 IF UNIT Z3 adjustment

(1) Filter and Step Amplifier adjustment

Item	Adj. Position	Adjustment	Setting
21.4 MHz BPF Adj.			(MS610B/J/J1) Gain Adj. (on front panel) Max. counterclockwise
Z3-L4			(MS420B) Scale 10 dB/div Freq. Span 10 MHz
Z3-L2,L3,L6			
			(MS420B) Scale 1 dB/div Freq. Span 3 MHz



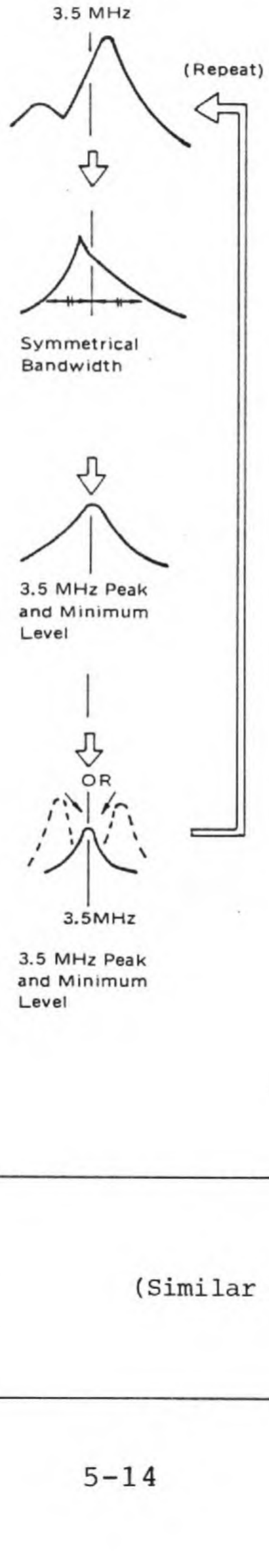
(MS610B/J/J1)

Ref. Level -10 dBm, Input Att. 10 dB,

Reference Level Unit Selector Switch (Rear panel)
"7" and RBW 9 kHz

Fig. 5-3 CRYSTAL Filter Adjustment (Z3 IF)

(1) (continued)

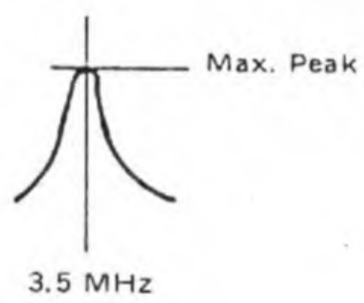
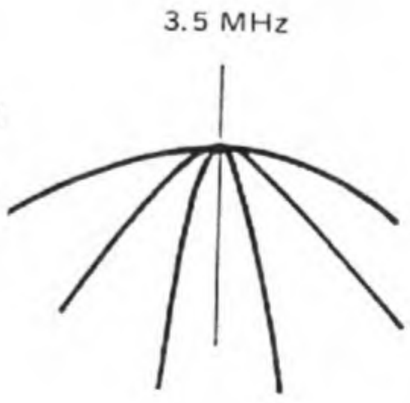
Item	Adj. Position	Adjustment	Setting
Crystal Filter Adj. (1st stage)	J6-left side strapped. J8,J10,J12 -right side strapped Z3-C32 Z3-L15 Z3-L15		Meas. Circuit: Refer to Fig. 5-3 (MS420B) Scale 10 dB/div Freq. span 200 kHz (MS420B) Scale 1 dB/div Freq. Span 50 kHz
(2nd Stage)	J8-left side strapped. J6,J10,J12-right side strapped. Z3-C36,L16	(Similar to 1st stage.)	

(1) (continued)

Item	Adj. Position	Adjustment	Setting
3rd Stage	J10-left side strapped. J6,J8,J12-right side strapped. Z3-C47,L21	(Similar to 1st stage.)	
4th stage	J12-left side strapped. J6,J8,J10-right side strapped. Z3-C51,L22	(Similar to 1st stage.)	

Note:

When Crystal Filter has been adjusted, J6,J8,J10 and J12 are strapped on the left side.

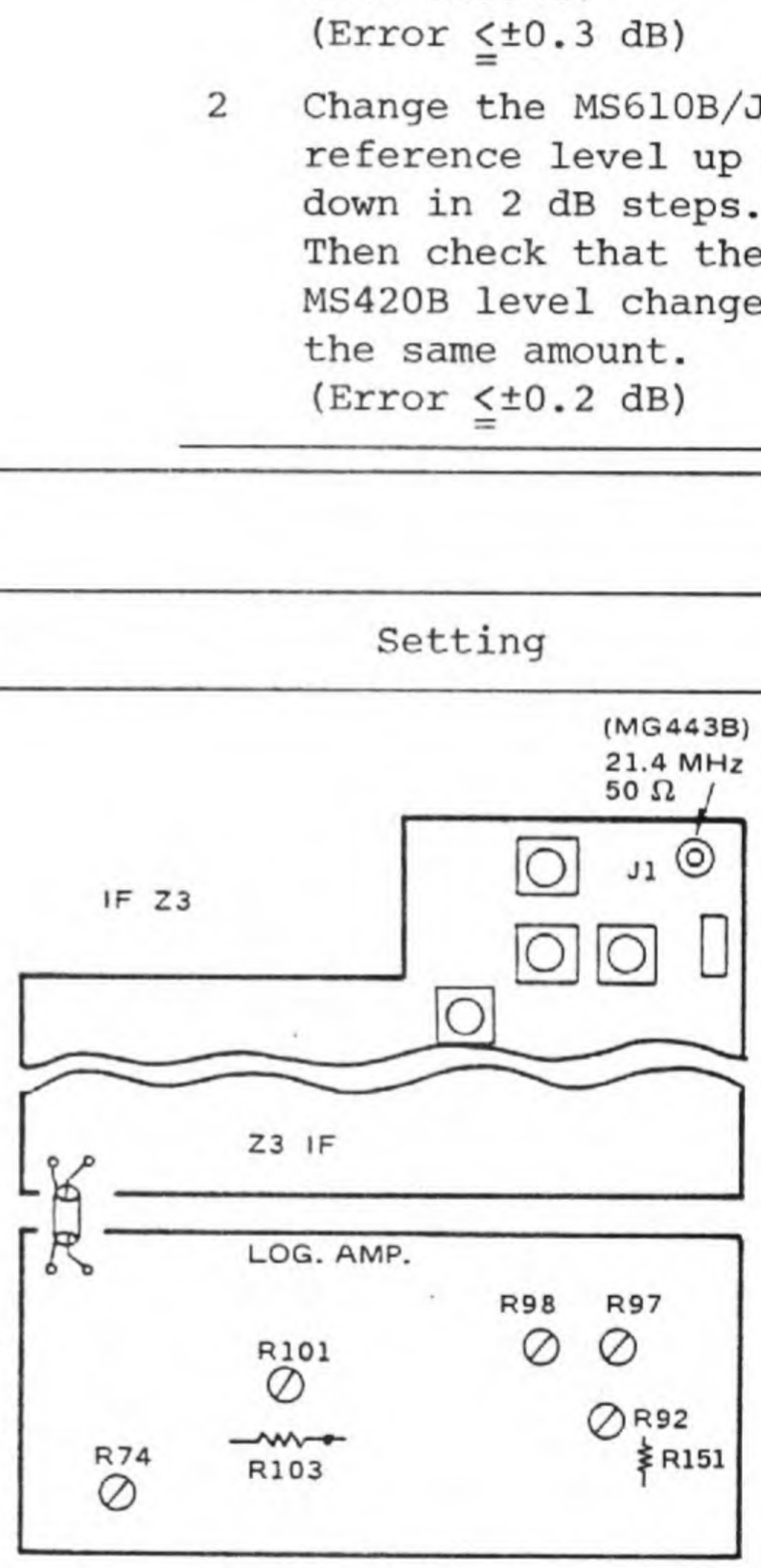
LC Filter Adj.	Z3-C31,C35 C46,C50		Setting is the same as crystal filter adj. except that: (MS610B/J/J1) RBW 10 kHz (MS420B) Scale 1 dB/div
RBW Gain Deviation Adj.	RBW R53 120 kHz, 1 MHz R52 100 kHz, 300 kHz R51 10 kHz R50 3 kHz, 9 kHz R49 1 kHz		Setting is similar to crystal filter adj. Adjust each level of 3.5 MHz at RBW = 1 MHz,300 kHz, 100 kHz,10 kHz,3 kHz, and 1 kHz equal to the level (approx. -33 dBm) of 3.5 MHz at RBW = 30 kHz.
Step Amplifier Check			Setting is similar to crystal filter adj.

Step	Procedure
1	Change the MS610B/J/J1 Input Atten up or down by 10 dB steps.

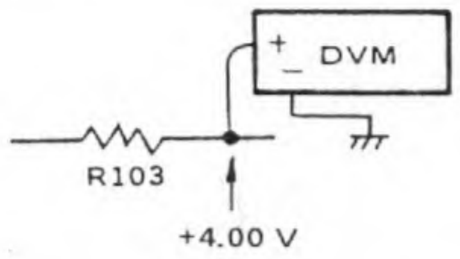
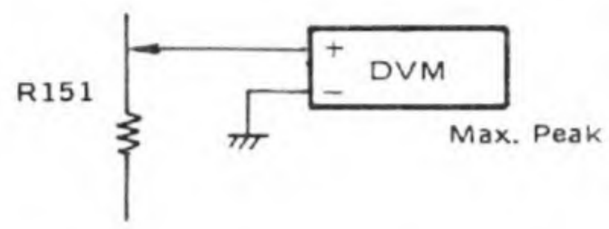
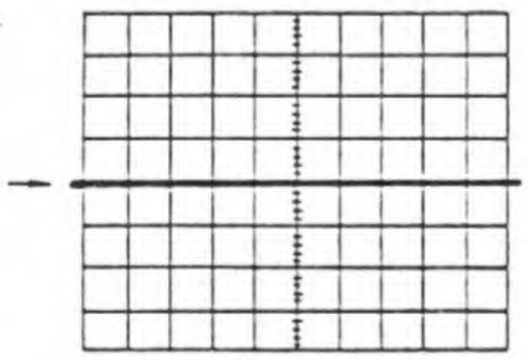
(1) (continued)

Item	Adj. Position	Adjustment	Setting
Step Amplifier Check (cont.)			Step Procedure (cont.) Then check that MS420B level changes by the same amount. (Error ≦±0.3 dB) 2 Change the MS610B/J/J1 reference level up or down in 2 dB steps. Then check that the MS420B level changes by the same amount. (Error ≦±0.2 dB)

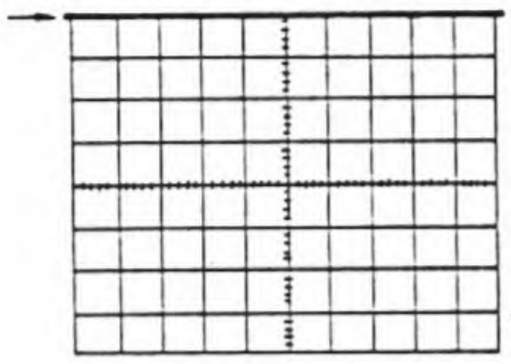
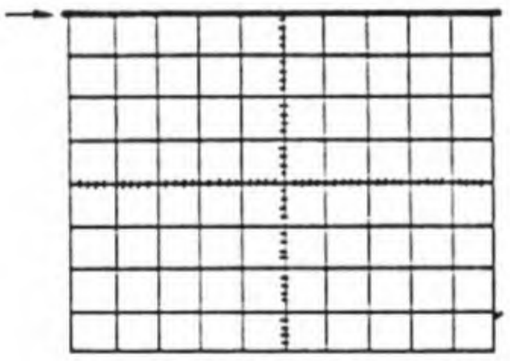
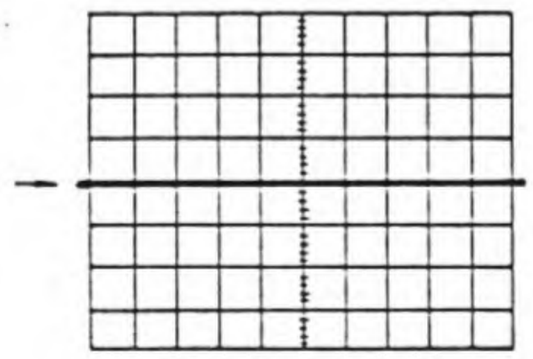
(2) LOG. Amplifier adjustment

Item	Adj. Position	Adjustment	Setting
(Preparation)			 (MS610B/J/J1) Ref. Level -10 dBm Input Att. 10 dB Gain Adj. center (±4 dB) RBW 1 kHz Adjust TRACE ROTATION at Linear Scale with no input level. Set INTENSITY knob at 2 o'clock.

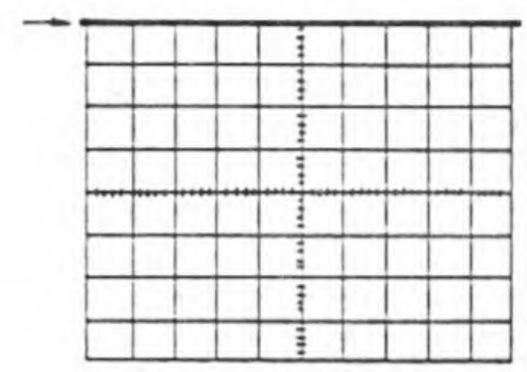
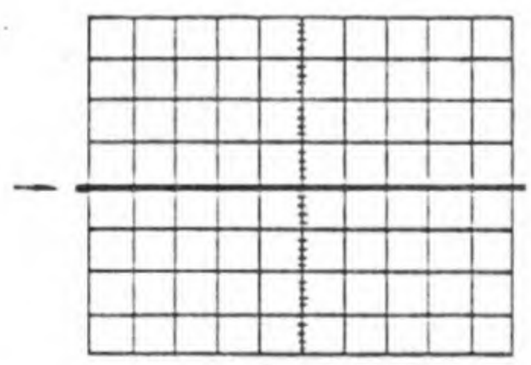
(2) (continued)

Item	Adj. Position	Adjustment	Setting
Reference +4 V Adj.	R101		(MG443B) -20 dBm (MS610B/J/J1) 10 dB/div
Linearity of 10 dB/ div Adj. (1)		 Vary the frequency of MG443B in 10 Hz steps to get max. peak voltage on the DVM.	(MG443B) -20 dBm (MS610B/J/J1) 10 dB/div
(2)	R92	Adjust for DVM +4.000 V	
(3)	R97	Adjust for DVM +2.000 V	(MS610B/J/J1) 10 dB/div (MG443B) -60 dBm
(4)	CRT DRIVE Z12-R40	 Display line on the center horizontal line.	(MS610B/J/J1) 10 dB/div (MG443B) -60 dBm

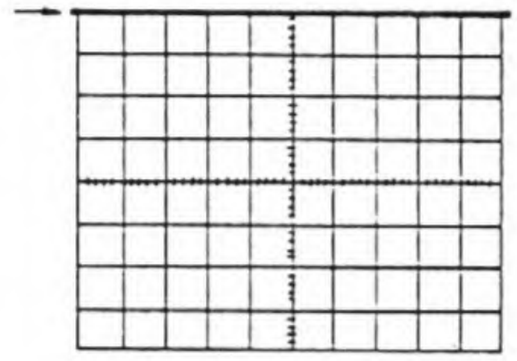
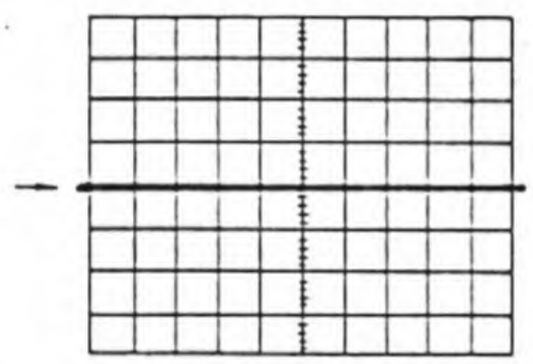
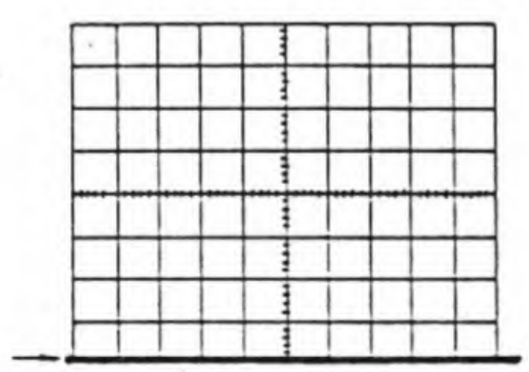
(2) (continued)

Item	Adj. Position	Adjustment	Setting
(5) Linearity of 10 dB/ div Adj. (cont.)	CRT DRIVE Z12-R33	 Display line on the top horizontal line.	(MG443B) -20 dBm (MS610B/J/J1) 10 dB/div
(6)	Measure the level difference (a). a = ([level at 10 dB/div scale] - [level at linear scale]) with no MG443B output level.		
(7)	R92	 Display line on the top horizontal line.	(MG443B) -20+a dBm (MS610B/J/J1) 10dB/div
(8)	R97	 Display line on the center horizontal line.	(MS610B/J/J1) 10 dB/div (MG443B) -60+a dBm
(9)	Repeat the Items (6) (7) (8) to get a = 0.		

(2) (continued)

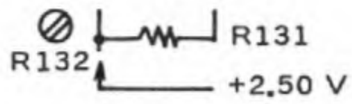
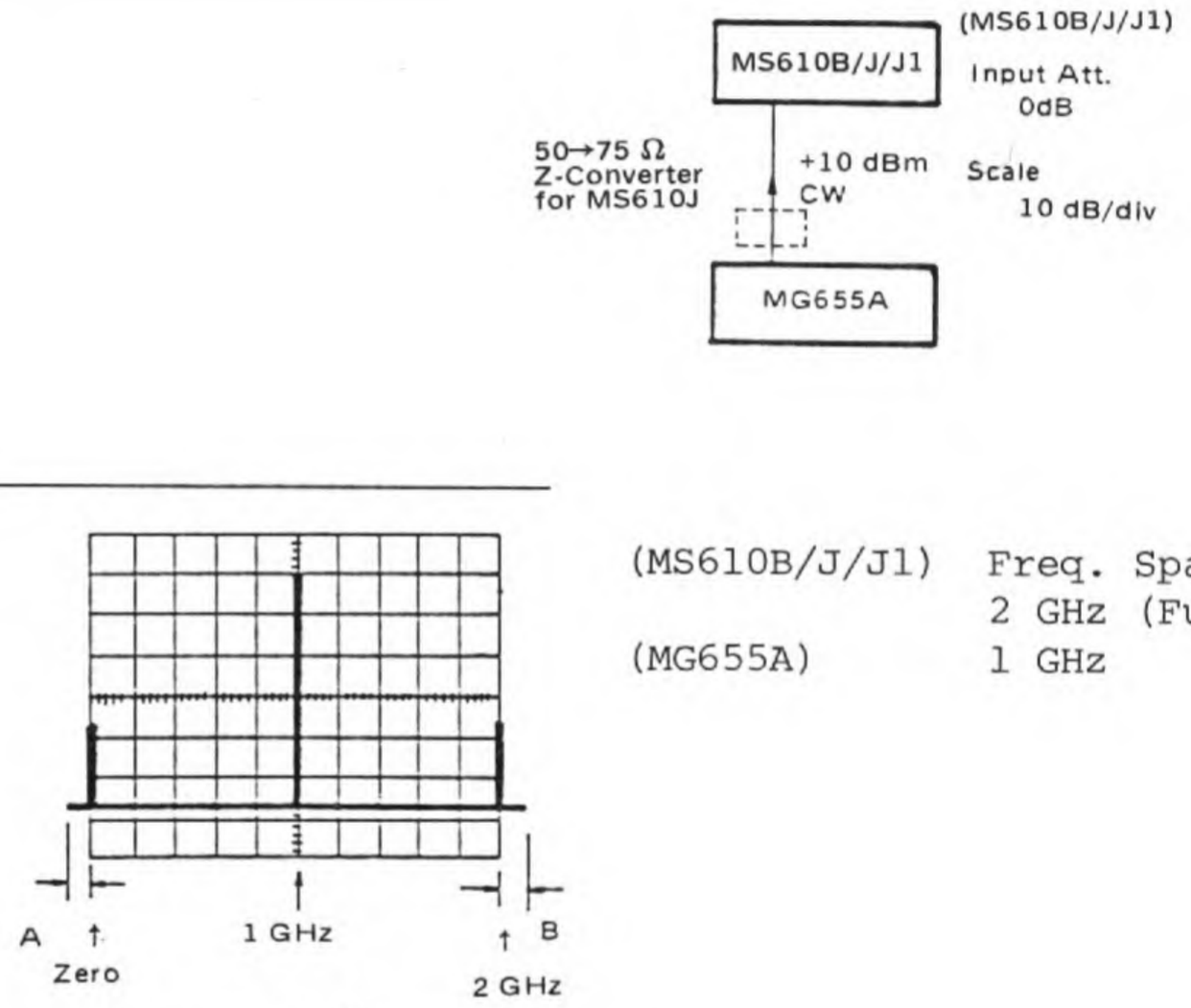
Item	Adj. Position	Adjustment	Setting
(10) Linearity of 10 dB/ div Adj. (cont.)			(MS610B/J/J1) 10 dB/div Vary the level of MG443B by 10 dB steps. Check that the display line variations are 10 ±1.5 dB.
Linearity of 2 dB/ div Adj. (1)	R101	 Display line on the top horizontal line.	(MG443B) -20 dBm (MS610B/J/J1) 2 dB/div
(2)	R98	 Display line on the center horizontal line.	(MS610B/J/J1) 2 dB/div (MG443B) -28 dBm
(3)			(MS610B/J/J1) 2 dB/div Vary the level of MG443B by 2 dB steps. Check that the display line variations are 2 ±1.0 dB.

(2) (continued)

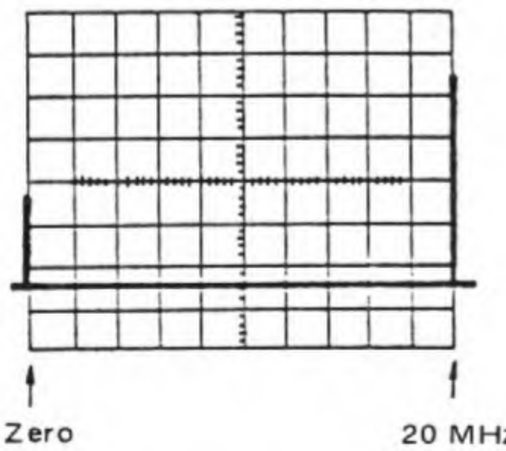
Item	Adj. Position	Adjustment	Setting
Linear Scale Linearity Adj. (1)	R74	 Display line on the top horizontal line.	(MG443B) -20 dBm (MS610B/J/J1) Linear Scale
(2)		 Confirm that display line on the center horizontal line.	(MS610B/J/J1) Linear Scale (MG443B) -26 dBm
(3)		 Confirm that display line on the bottom horizontal line.	(MG443B) OFF (MS610B/J/J1) Linear Scale

5.5.5 Overall adjustment

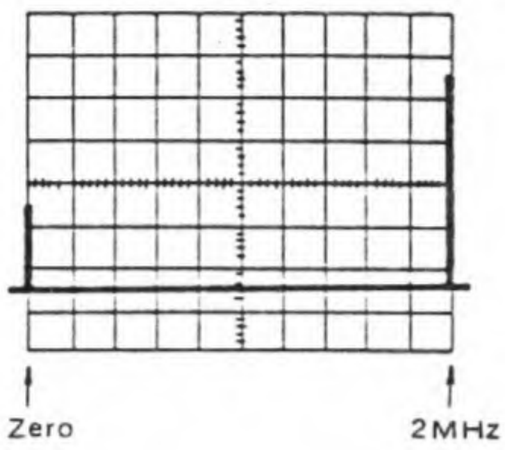
(1) Horizontal display adjustment

Item	Adj. Position	Adjustment	Setting
CPU Ref. Level Adj.	CPU Z10-R132		
1 GHz Display at 2 GHz Span (Horizontal Position) Adj.	CRT DRIVE Z12-R62	 1 GHz spectrum on center scale line	

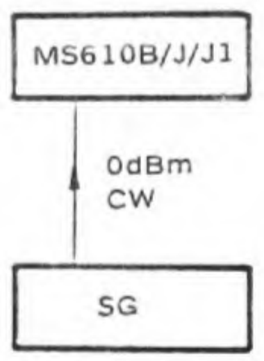
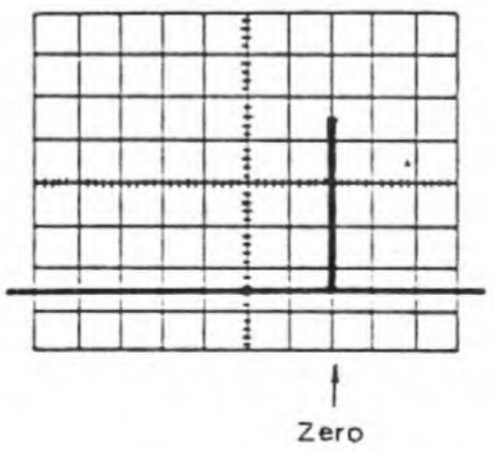
(1) (continued)

Item	Adj. Position	Adjustment	Setting
Zero Beat Display at 2 GHZ Span (Horizontal Gain) Adj.	CRT DRIVE Z12-R55	Zero beat display on the left side scale line. 2 GHz spectrum on the right side scale line.	
Full-scan Voltage Adj.	SCAN Z9-R46	A = B (starting bottom line length A is equal to ending bottom line length B.)	
Zero Beat Display at 1 GHz Span Adj.			(MS610B/J/J1) Freq. Span 1 GHz Start Freq. ON Adjust the Freq. Coarse dial to set the zero beat display on the left side scale line.
	SCAN Z9-R50	Zero beat display on the center scale line.	(MS610B/J/J1) Center Freq. ON
20 MHz Span Adj.	YTO DRIVE Z5-R53	 20 MHz spectrum on the right side scale line	(MS610B/J/J1) Freq. Span 20 MHz Start Freq. ON Adjust the Freq. Coarse dial to set the zero beat display on the left side scale line. (MG655A) 20 MHz

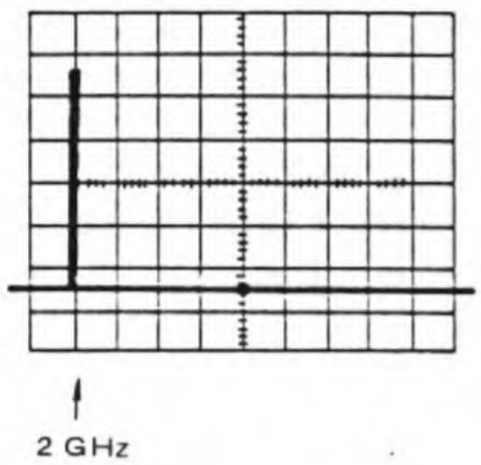
(1) (continued)

Item	Adj. Position	Adjustment	Setting
2 MHz Span Adj.	YTO DRIVE Z5-R11	 2 MHz spectrum on the right side scale line	(MS610B/J/J1) Freq. Span 2 MHz Start Freq. ON Adjust the Freq. Coarse dial to set the zero beat display on the left side scale line. (MG655A) 2 MHz

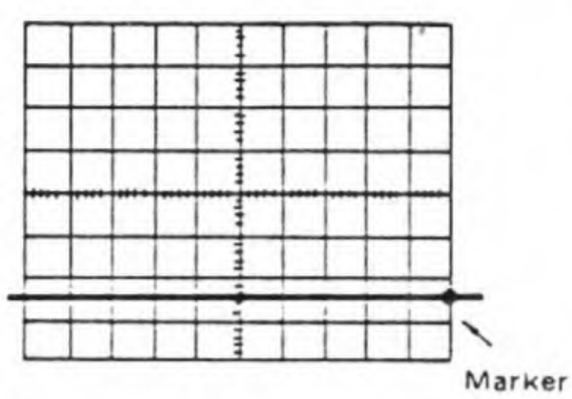
(2) Frequency display adjustment

Item	Adj. Position	Adjustment	Setting
			Freq. Span 50 MHz
Zero Beat at 50 MHz Span Adj.	YTO DRIVE Z5-R29	 Zero beat display on the 3rd line from right side scale line	(MS610B/J/J1) Freq. Coarse max. counterclockwise Freq. Fine 5 complete turns from either end.

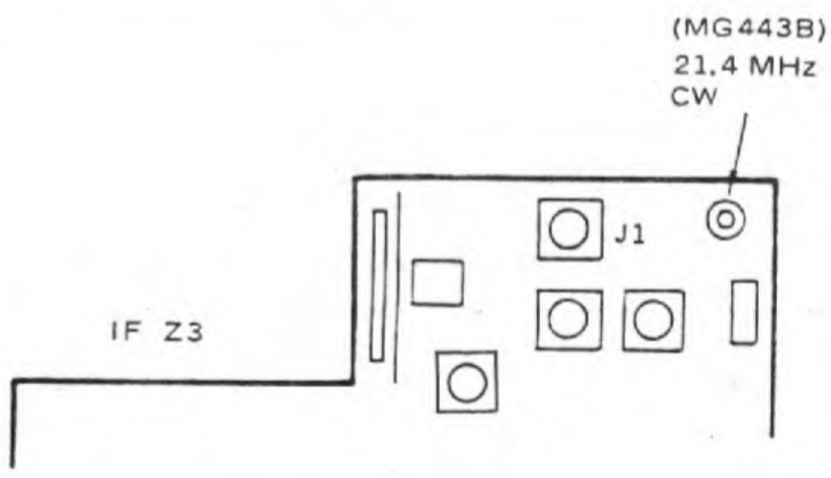
(2) (continued)

Item	Adj. Position	Adjustment	Setting
Freq. Display "0" Adj.	Freq. Zero Adj. (on the front panel)	Frequency display between "0" and "1"	(MS610B/J/J1) Adjust the Freq. Coarse dial to set the zero beat display on the center scale line.
2 GHz Display Adj.	YTO DRIVE Z5-R24	 2 GHz display on the 2nd line from the left side scale line.	(SG(MG724A1)) 2 GHz (MS610B/J/J1) Freq. Coarse- max. clockwise
Freq. Display "1000" Adj.	YTO DRIVE Z5-R39	Frequency display "1000"	(SG(MG655A)) 1 GHz (MS610B/J/J1) Adjust the Freq. Coarse dial to set the 1 GHz display on the center scale line.
Freq. Display "1100" Adj.	SCAN Z9-R16	Frequency display "1100"	(SG(MG655A)) 1.1 GHz (MS610B/J/J1) Adjust the Freq. Coarse dial to set the 1.1 GHz display on the center scale line.
Freq. Display "2000" Adj.	YTO DRIVE Z5-R39	Frequency display "2000" ±2	(SG(MG724A1)) 2 GHz (MS610B/J/J1) Adjust the Freq. Coarse dial to set the 2 GHz display on the center scale line.

(2) (continued)

Item	Adj. Position	Adjustment	Setting
Full Span Marker Adj.	SCAN Z9-R98	 Center position of the Marker on the right side scale line.	(MS610B/J/J1) Frequency display "2000" Freq. Span 2 GHz (Full)

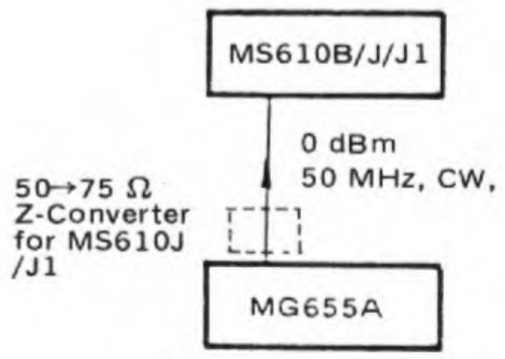
(3) Vertical display adjustment

Item	Adj. Position	Adjustment	Setting
			(MS610B/J/J1) Ref. Level -10 dBm Input Att. 10 dB RBW 1 kHz GAIN ADJ Center (±4 dB)

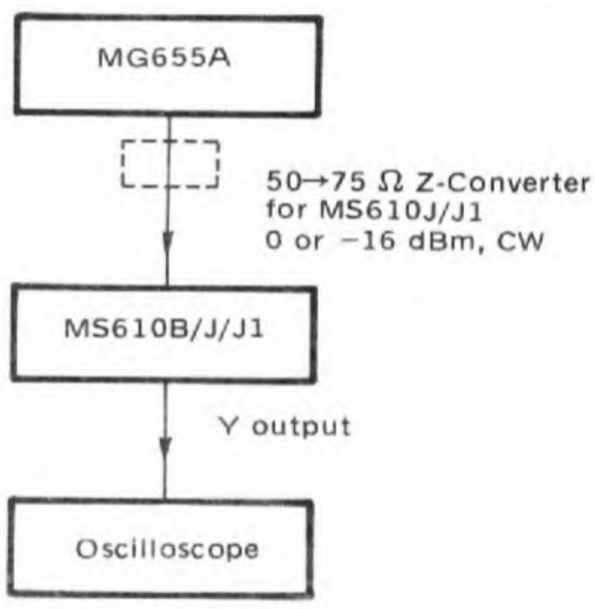
(3) (continued)

Item	Adj. Position	Adjustment	Setting
Marker Level Offset Adj.	SCAN Z9-R21	Level display "-50" dBm	(MG443B) -70 dBm (MS610B/J/J1) Marker Level ON Scale 10 dB/div
Marker Level Gain Adj.	Scan Z9-R18 Adjust Simultaneously	Level display "0.0" dBm	(MG443B) -20 dBm (MS610B/J/J1) Marker Level ON Scale 10 dB/div
Marker Level Linearity Check			(MS610B/J/J1) Marker Level ON Scale 10 dB/div Vary the level of MG443B by 10 dB steps. Check that the marker level display varies by 10 dB.

(4) Overall gain adjustment

Item	Adj. Position	Adjustment	Setting
IF Gain Adj.	IF Z3,-R6,R9	Gain Adj. knob (on front panel) can vary display by ±3 dB or more.	 (MS610B/J/J1) Ref. Level 0 dBm Freq. Span 50 MHz

(5) XYZ output adjustment

Item	Adj. Position	Adjustment	Setting
X output Adj.	XYZ Output Z17-R10	0 V	
	Z17-R6	+5 V	(MS610B/J/J1) Sweep time 0.5 s
Y output Adj.	XYZ Output Z17-R11	0 V	 (MS610B/J/J1) RBW 300 kHz Freq. Span 0 MHz Ref. Level 0 dBm Scale 2 dB/div Set the display line on the bottom horizontal line by adjusting GAIN ADJ. (MG655A) Output level -16 dBm
	XYZ Output Z17-R7	+5 V	(MS610B/J/J1) Set the display line on the top horizontal line by adjusting GAIN ADJ. (MG655A) Output level 0 dBm

SECTION 6

REPLACEABLE PARTS

6.1 Introduction

This section contains information about ordering replacement parts or components. The following tables (Tables 6-2 and 6-3) shows circuit references (hereafter: CKT REF) and abbreviations used for items in the Parts Lists. The quantity of each item in the Parts List is "one" unless a quantitative description is given in the "NOTE" column.

6.2 Ordering Information

When ordering parts, please supply the following descriptions from the PARTS LIST.

Table 6-1 Ordering INformation

No.	Item	Example
1	Instrument name	MS610B Spectrum Analyzer
2	Part location	Part of MS610B/J/J1 Spectrum Analyzer
3	CKT REF	F1
4	Part name	T1A250V Note: Part name is given in parentheses ( ) in the Parts List. Parts with asterisks* require factory adjustment upon repair. When ordering part(s) marked with asterisk, give full description of the part(s).
5	Quantity	1
6	Instrument serial no.	M31257

When ordering PC boards with parts mounted, please include the Z-number under item (2) above instead of items (3) and (4). (See Table 4-1 for PC board number.)

Table 6-2 Circuit References

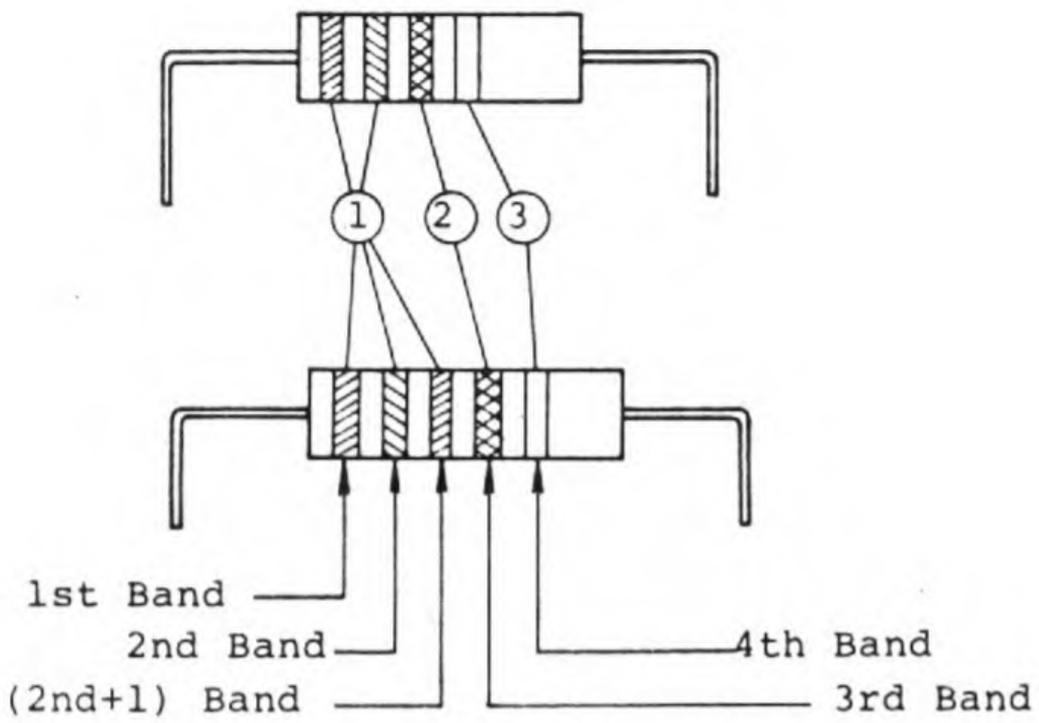
AT:	Attenuator	K:	Relay	Q:	Transistor, diode, IC, rectifier	V:	Neon lamp, vacuum tube
C:	Capacitor	L:	Coil, microinductor	R:	Resistor	X:	Crystal OSC
F:	Fuse	M:	Meter, timer	S:	Switch	Z:	Unit
J:	Jack, plug, connector	P:	Lamp	T:	Transformer		

Table 6-3 Abbreviations

A:	amperes	Multi:	multiplying
Att, R var:	variable attenuator using film elements	N-ch:	N-channel
		non-lin:	non-linear taper
BL:	boundary layer	Non-pol:	non polarity
Cer:	ceramic	NPN:	negative-positive-negative
CF:	carbon film	Ω:	ohms
Comp:	composition	p:	pico (x 10^{-12})
CRT:	cathode-ray tube	Plast:	plastic film
Di:	diode	PMTR:	potentiometer
DIP:	dual in-line package	PNP:	positive-negative-positive
Elect:	electrolytic aluminum	p-p:	peak-to-peak value
F:	farad	RFC:	RF choke
FET:	field-effect transistor	R-lamp:	resistor lamp
G:	ground	rms:	effective value (root-mean-square)
Ge:	germanium	SBD:	Schottky barrier diode
H:	henry	SCR:	silicon-controlled rectifier
Hz:	hertz	Si:	silicon
IC:	integrated circuit	SRD:	step-recovery diode
IEC:	Conforms to IEC Safety Standards.	Tant:	tantalum
J-FET:	junction FET	TM:	time-lag
k:	kilo (x 10^{3})	Tr:	transistor
LED:	light-emitting diode	Trans:	transformer
M:	mega (x 10^{6})	μ:	micro (x 10^{-6})
m:	milli (x 10^{-3})	V:	volt
MF:	metallized film	Var:	variable
MOS-FET:	metal-oxide semiconductor FET	WW:	wire-wound
M paper:	metallized paper	XTAL:	crystal
M plast:	metallized plastic film		

6.3 Reading Resistance/Capacitance

6.3.1 Resistance



COLOR	① Figure		② Multiplier	③ Tolerance
	1st	2nd	3rd	4th
Black	0	0	$x10^0$	-
Brown	1	1	$x10^1$	-
Red	2	2	$x10^2$	-
Orange	3	3	$x10^3$	-
Yellow	4	4	$x10^4$	-
Green	5	5	$x10^5$	±0.5%
Blue	6	6	$x10^6$	-
Purple	7	7	$x10^7$	-
Grey	8	8	$x10^8$	-
White	9	9	$x10^9$	-
Gold	-	-	$x10^{-1}$	±5%
Silver	-	-	$x10^{-2}$	±10%
-----	-	-		±20%

For Examples:

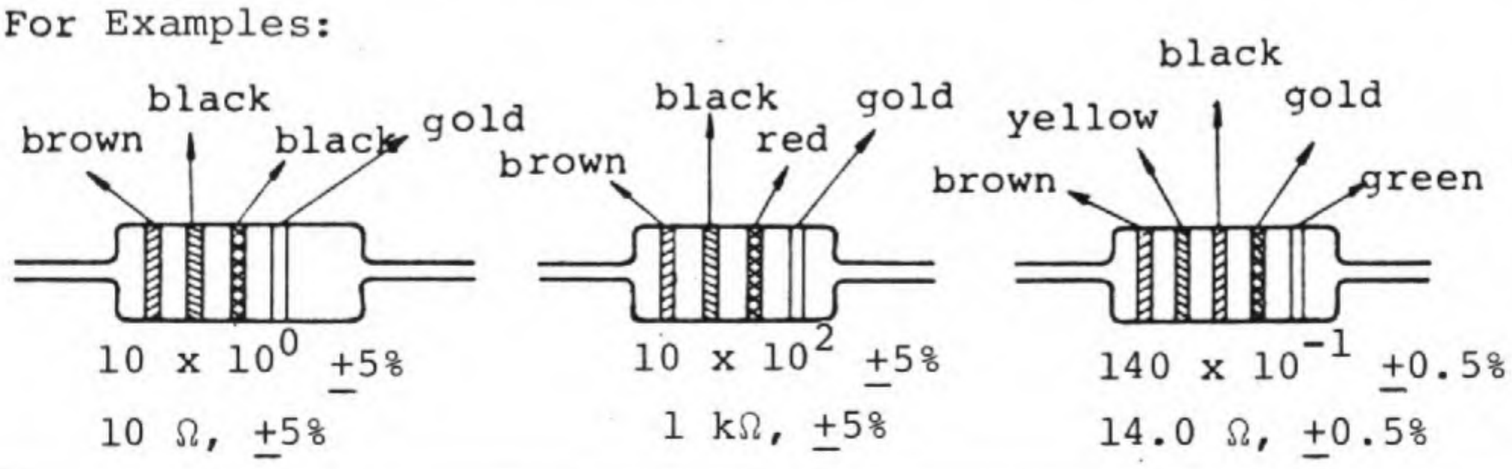
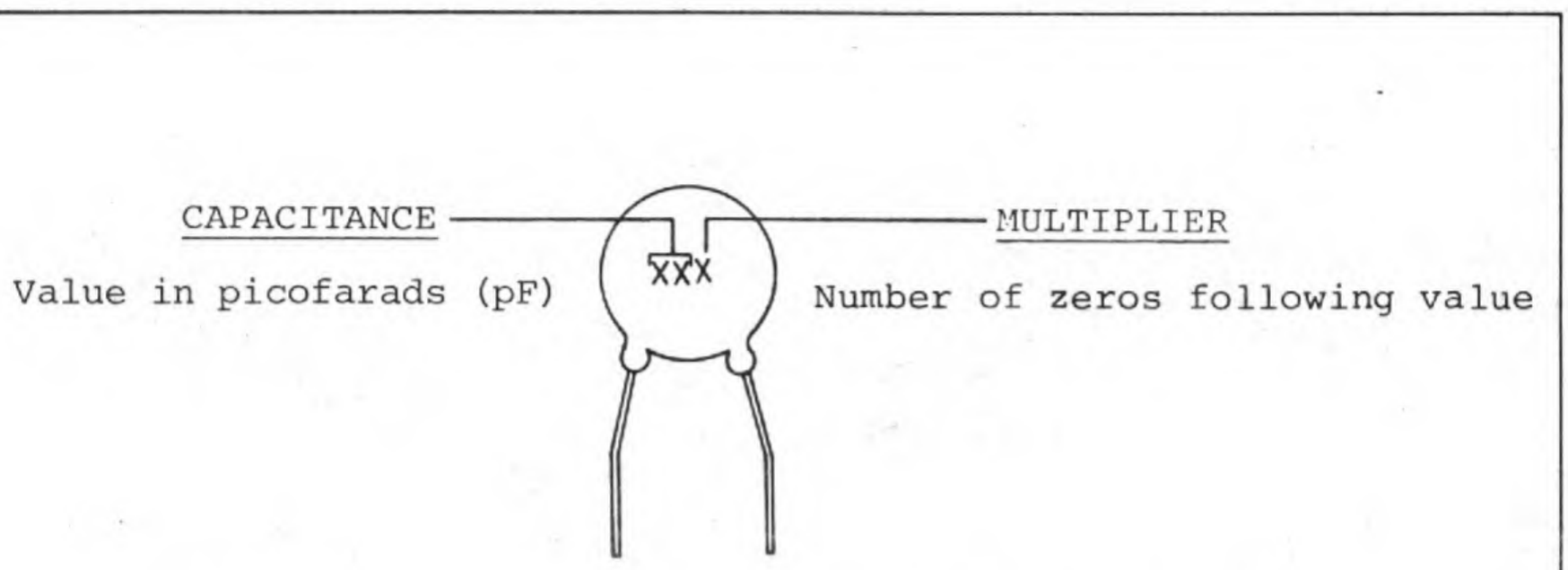


Fig. 6-1 Reading Resistance

6.3.2 Capacitance



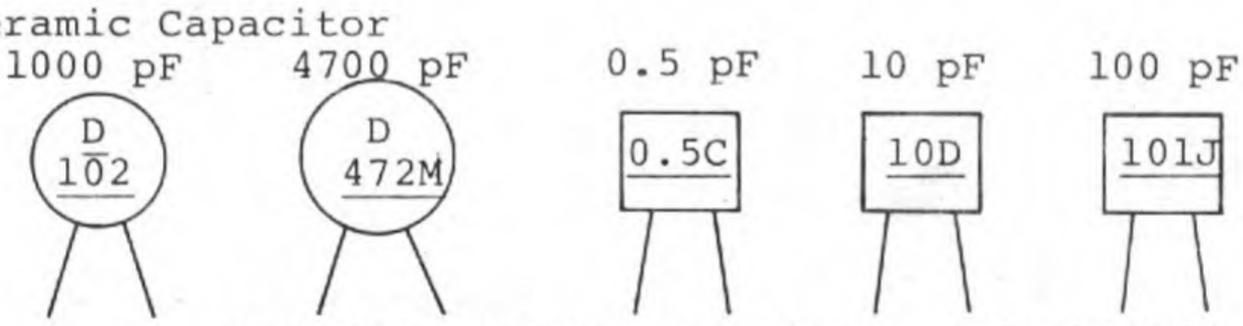
EXAMPLES: 103 = 10,000 pF = 10^{-8} F or 0.01 µF
302 = 3,000 pF = $3x10^{-9}$ F or 0.003 µF
676 = 67,000,000 pF = $67x10^{-6}$ F or 67 µF

(a) Ceramic and polyester capacitors

Indication	0.5	1	10	101	102	103	104
Capacity	0.5 pF	1 pF	10 pF	100 pF	1000 pF	0.01 µF	0.1 µF

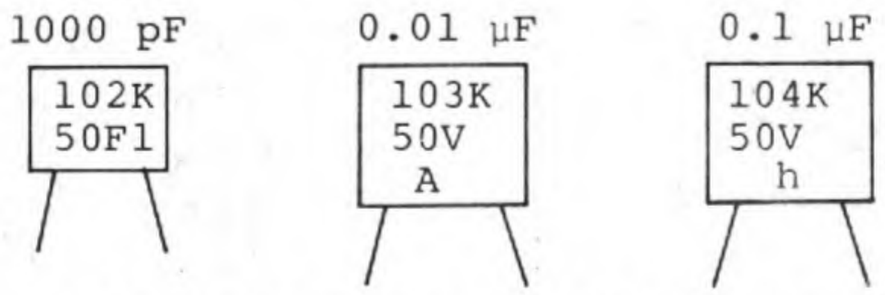
Example:

Ceramic Capacitor



Capacity values are always underlined.

Polyester Capacitor



(b) Tantalum, metallized, and electrolytic capacitors

Indication	OR47	010	100	101
Capacity	0.47 µF	1 µF	10 µF	100 µF

Fig. 6-2 Reading Capacitance

6.4 Semiconductor Markings

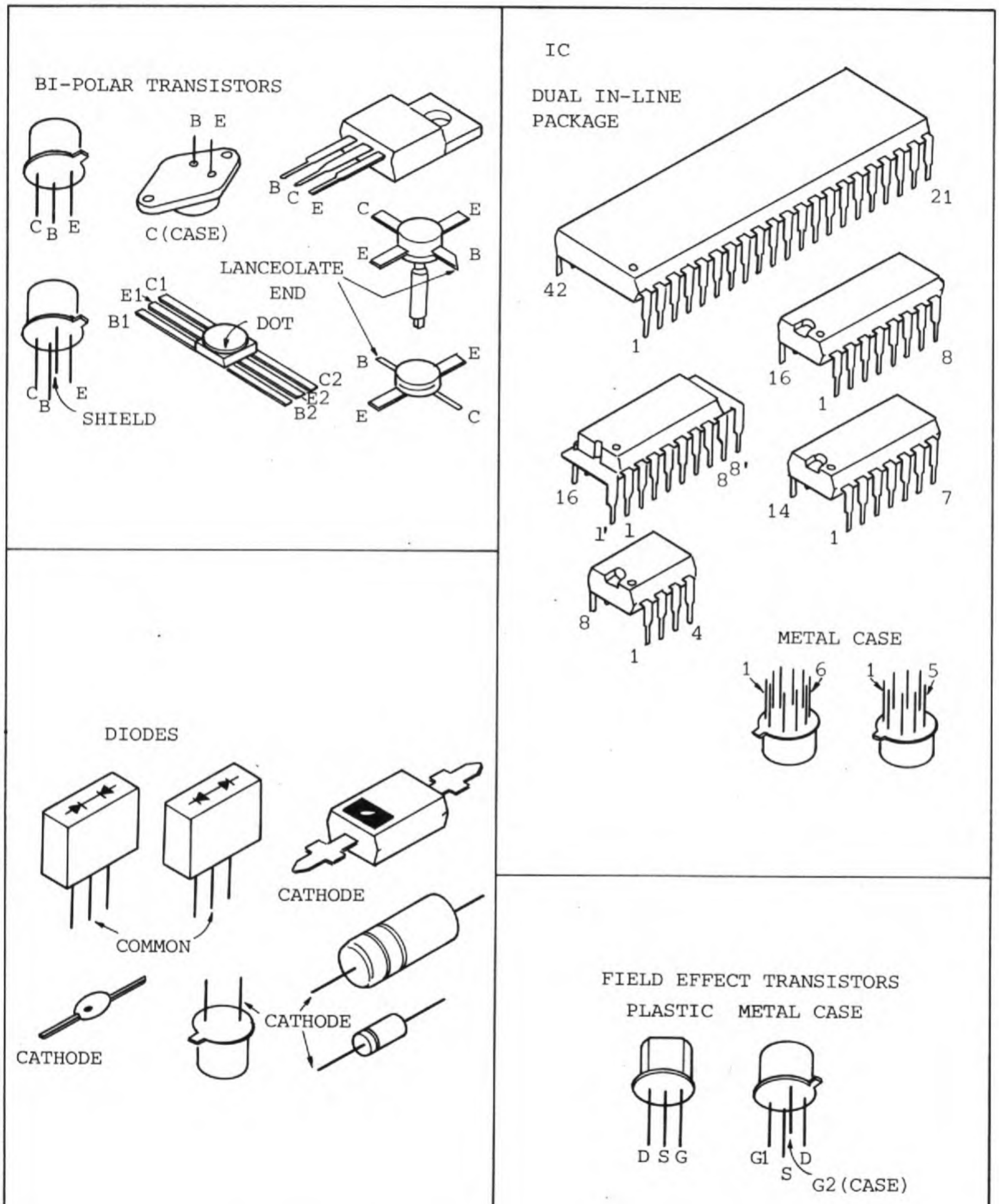


Fig. 6-3 Semiconductor Markings

6.5 Parts List

Circuit Diagram No.	Z No.	Name	Parts List No.
2	-	MS610B/J/J1 Spectrum Analyzer	34W 89577
4	Z11	FRONT PANEL (I)	34W 85992
5	Z11	FRONT PANEL (II)	34W 85989
7	Z3	IF	34W 89580
10	Z9 & Z10	SCAN & CPU	34W 89584
12	Z12	CRT DRIVE	34W 85994
14	Z5	YTO DRIVE	34W 85995
16	Z2	RF CONVERTER	34W 85987
17	-	2nd CONVERTER	34W 89581
18	-	50 MHz OSC	34W 85990
19	-	2.5214 GHz PRE AMP	34W 89578
20	-	2.5 to 4.5 GHz LO AMP	34W 89426
21	-	6 dB PAD	34W 89428
22	Z14	DIGITAL SW	34W 86018
24	Z7	POWER SUPPLY	34W 87893
25	Z17	XYZ OUTPUT	34W 89299
26	Z16	GP-IB (Option-1)	34W 85991

CKT REF	DESCRIPTION	RATING		NOTE
F 1	Fuse,TM,(T***A250V)	***A,250V		
F 2	Fuse,TM,(T***A250V)	***A,250V		6KA643
J 1	Connector,(NM11-2F)			
J 2	Connector,(NM11-2F)			
J 3	Connector, (27DP-LP-1.5)			
J 4	Connector, (27DP-P-1.5)			
J 5	Connector,(NM11-2F)			
J 6	Connector,(NM11-2F)			
J 7	Connector, (27DP-LP-1.5)			
J 8	Connector, (27DP-P-1.5)			
J 9	Connector, (DF1-20S-2.5R24-30D)			
J10	Not assigned			
J11	Connector, (DF1-15S-2.5R24-30A)			
J12	Connector, (DF1-20S-2.5R24-30D)			
J13	Connector, (DF1-5S-2.5R24-30C)			
J14	Connector,(BNC-PJ-1.5)			
J15	Connector, (DF1-10S-2.5R24-20C)			
J16	Connector, (DF1-3S-2.5R24-30A)			
J17	Connector, (DF1-20S-2.5R24-10C)			
J18	Not assigned			
J19	Connector, (DF1-3S-2.5R24-30A)			
J20	Socket,(CRT)			
J21	Connector, (DF1-15S-2.5R24-20A)			
J22	Connector, (DF1-3S-2.5R24-15A)			
J23	Not assigned			
J24	Terminal,(A12)			
J25	Inlet,(8843-2SP FL4/364)			
J26	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

CKT REF	DESCRIPTION	RATING		NOTE
J27	Connector, (27DP-LP-1.5W)			
J28	Connector, (DF1-8S2.5R24)			
J29	Connector, (DF1-8S2.5R24-30A)			
J30	Connector,(BNC-R)			
J31	Connector,(BNC-R)			
J32	Connector,(BNC-R)			
J33	Connector, (P-1306-DB)			
J34	Connector,(1625-4R)			
J35	Connector,(1625-4P-1)			
J36	Connector, (DF1-8S-2.5R24)			
J37	Connector, (DF1-8S-2.5R24)			
K 1	Relay, (HC4-TM-DC24V)			
R 1	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 2	Var,MF,(RG161N15SB 10kΩM)	10kΩ,1/2W		
R 3	Var,MF,(RG161N15SB 10kΩM)	10kΩ,1/2W		
S 1	Switch,(1852)			Japan Hz
T 1	Power trans,(63HA80)			
Z 1	Block,(PATT)			
Z 2	RF Converter			
Z 3	IF PKG			
Z 4	YTO			
Z 5	YTO Drive PKG			
Z 6	Potentiometer, (20HHP-10S-10kΩJ)			
Z 7	Power Unit			
Z 8	Noise Filter, (ZCB2203-11)			

( ): Manufacturer's part number
* : Selected at factory

CKT REF	DESCRIPTION	RATING		NOTE
Z 9	Scan & CPU (Scan) PKG			
Z10	Scan & CPU (CPU) PKG			
Z11	Front Panel (1)(2) PKG			
Z12	CRT Drive PKG			
Z13	CRT,(150CUB39)			
Z14	Digital SW PKG			
Z15	Potentiometer, (20HP-10S-10kΩH)			
Z16	GP-IB PKG			(Option)
Z17	XYZ-Output PKG			

( ): Manufacturer's part number
* : Selected at factory

CKT REF	DESCRIPTION	RATING		NOTE
C 1 to C20	Not assigned			
C21	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C22	Tant,(CS-E1V4R7M)	4.7μF,±20%,35V		
C23	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
Q 1	LED,(LN524CK)			
Q 2	Not assigned			
Q 3	LED,(LN524CK)			
Q 4	Not assigned			
Q 5	LED,(LN513CK)			
Q 6	LED,(LN513GA)			
Q 7	LED,(LN513GK			
Q 8	LED,(LN513GK)			
Q 9	LED,(LN513GK)			
Q10	LED,(LN513CK)			
Q11	LED,(LN513GK)			
Q12	LED,(LN513GK)			
Q13 to Q26	Not assigned			
Q27	IC,(TC4511BP)			
Q28	IC,(TC4511BP)			
Q29	Not assigned			
Q30	Not assigned			
Q31	Not assigned			
Q32	Not assigned			
Q33	Not assigned			
Q34	Not assigned			
Q35	IC,(TC4511BP)			
Q36	IC,(TC4511BP)			
Q37	Not assigned			
Q38	Not assigned			
Q39	Not assigned			
Q40	LED,(LT9200N)			
Q41	LED,(LT9200N)			
Q42	LED,(TLY226)			
Q43	LED,(TLY226)			
Q44	LED,(LT9002N)			
Q45	LED,(LT9200N)			
Q46	LED,(LT9200N)			
Q47	LED,(LT9002N)			
Q48	LED,(LT9200N)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : FRONT PANEL (1) 4

CKT REF	DESCRIPTION	RATING		NOTE
Q49	LED,(TLY226)			
Q50	LED,(LT9002N)			
Q51	LED,(LT9200N)			
Q52	LED,(LT9200N)			
Q53	LED,(LT9002N)			
Q54	LED,(TLG226)			
Q55	LED,(TLG226)			
Q56	LED,(TLG226)			
Q57	LED,(TLG226)			
Q58	LED,(TLG226)			
Q59	LED,(TLG226)			
Q60	LED,(TLG226)			
Q61	Not assigned			
Q62 to Q72	LED,(HL20-LSYG)			
Q73	Not assigned			
Q74	Di,breakdown,(RD2.7EB)	2.5 to 2.9V,400mW		
Q75	Not assigned			
Q76	Not assigned			
Q77	Not assigned			
Q78	Not assigned			
Q79	Not assigned			
Q80	Not assigned			
Q81	Not assigned			
Q82	Not assigned			
Q83	Not assigned			
Q84	IC,(MM74C923N)			
Q85	LED,(TLG226)			
Q86	LED,(TLG226)			
Q87	LED,(TLG226)			
Q88	LED,(TLG226)			
R 1	Not assigned			
R 2	Not assigned			
R 3	Dual in-lin array, (AHR-561JB)	560Ω,1/8W		
R 4	Dual in-line array, (AHR-561JB)	560Ω,1/8W		
R 5	Dual in-line array, (AHR-561JB)	560Ω,1/8W		
R 6	Dual in-line array, (AHR-561JB)	560Ω,1/8W		
R 7	Not assigned			
R 8	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : FRONT PANEL (1) 4

CKT REF	DESCRIPTION	RATING		NOTE
R 9	Not assigned			
R10	Not assigned			
R11	Not assigned			
R12	Not assigned			
R13	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R14	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R15	Not assigned			
R16	Not assigned			
R17	Not assigned			
R18	Not assigned			
R19	Not assigned			
R20	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R21	Var,MF,(RJ-13P 2kΩ)	2kΩ,1/2W		
R22	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R23	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R24	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R25	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R26	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R27	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
S 1	Switch,(HL20-LSYG)			
S 2	Switch,(HL20-LSYG)			
S 3	Switch,(HL20-LSYG)			
S 4	Switch,(HL20-LSYG)			
S 5	Switch,(HL20-LSYG)			
S 6	Switch,(HL20-LSYG)			
S 7	Switch,(HL20-LSYG)			
S 8	Switch,(HL20-LSYG)			
S 9	Switch,(HL20-LSYG)			
S10	Switch,(HL20-LSYG)			
S11	Switch,(HL20-NS)			
S12	Switch,(HL20-LSYG)			
S13	Switch,(KEG10901)			
S14	Switch,(HL20-NS)			
S15	Switch,(HL20-NS)			
S16	Switch,(HL20-NS)			
S17	Switch,(HL20-NS)			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : FRONT PANEL (2) 5

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 2	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 3	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 4	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 5	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 6	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 7	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 8	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 9	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
J 1	Connector, (DF1-20P-2.5DSA)			
J 2	Not assigned			
J 3	Not assigned			
J 4	Not assigned			
J 5	Not assigned			
J 6	Connector, (HIF2-50D-AB15S)			
Q 1 to Q21	Not assigned			
Q22	IC,(TD62003P)			
Q23	IC,(TD62003P)			
Q24	Not assigned			
Q25	IC,(TC4511BP)			
Q26	IC,(TC4511BP)			
Q27	Not assigned			
Q28	Not assigned			
Q29	IC,(TC4511BP)			
Q30	IC,(TC4099BP)			
Q31	IC,(TC4511BP)			
Q32	IC,(TC4511BP)			
Q33	IC,(TC4511BP)			
Q34	IC,(TC4099BP)			
Q35	Not assigned			
Q36	Not assigned			
Q37	IC,(TC40H042P)			
Q38	IC,(TC40H042P)			
Q39	IC,(TC4011BP)			
Q40 to Q74	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : FRONT PANEL (2) 5

CKT REF	DESCRIPTION	RATING		NOTE
Q75	IC,(TD62003P)			
Q76	IC,(TD62003P)			
Q77	IC,(TD62003P)			
Q78	IC,(TD62003P)			
Q79	IC,(TD62003P)			
Q80	IC,(TC4099BP)			
Q81	IC,(TC4099BP)			
Q82	IC,(TC4099BP)			
Q83	IC,(TC4099BP)			
Q84	Not assigned			
Q85	Not assigned			
Q86	Not assigned			
Q87	Not assigned			
Q88	Not assigned			
Q89	LED,(TLR226)			
R 1	Not assigned			
R 2	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 3	Not assigned			
R 4	Not assigned			
R 5	Not assigned			
R 6	Not assigned			
R 7	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R 8	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R 9	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R10	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R11	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R12	Dual in-line array, (AHR-122JB)	1.2kΩ,1/8W		
R13	Not assigned			
R14	Not assigned			
R15	Dual in-line array, (AHR-331JB)	330Ω,1/8W		
R16	Dual in-line array, (AHR-331JB)	330Ω,1/8W		
R17	Dual in-line array, (AHR-561JB)	560Ω,1/8W		
R18	Dual in-line array, (AHR-561JB)	560Ω,1/8W		
R19	Dual in-line array, (AHR-561JB)	560Ω,1/8W		

( ): Manufacturer's part number
* : Selected at factory

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Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 2	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 3	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 4	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 5	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 6	Cer,(CC924CH1H561J)	560pF,±5%,50V		
C 7	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C 8	Cer,(CC45CH1H240JY)	24pF,±5%,50V		
C 9	Not assigned			
C10	Cer,(CC924CH1H561J)	560pF,±5%,50V		
C11	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C12	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C13	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C14	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C15	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C16	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C17	Not assigned			
C18	Cer,(CC45CH1H050CY)	5pF,±0.25pF,50V		
C19	Cer,(CC45CH1H101JY)	100pF,±5%,50V		
C20	Not assigned			
C21	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C22	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C23	Not assigned			
C24	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C25	Not assigned			
C26	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C27	Elect,(CE04W1E221)	220μF,±20%,25V		
C28	Elect,(CE04W1E221)	220μF,±20%,25V		
C29	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C30	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C31	Var,Cer,(TZ03R200A)	20pF,±0.05pF,100V		
C32	Var,Cer,(TZ03R200A)	20pF,±0.05pF,100V		
C33	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C34	Cer,(CC92PH1H101JY)	100pF,±5%,50V		
C35	Var,Cer,(TZ03R200A)	20pF,±0.05pF,100V		
C36	Var,Cer,(TZ03R200A)	20pF,±0.05pF,100V		
C37	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C38	Cer,(CC92PH1H101JY)	100pF,±5%,50V		
C39	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C40	Elect,(CE04W1E221)	220μF,±20%,25V		
C41	Elect,(CE04W1E221)	220μF,±20%,25V		
C42	Not assigned			
C43	Not assigned			
C44	Not assigned			
C45	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
C46	Var,Cer,(TZ03P200A)	20pF,±0.05pF,100V		
C47	Var,Cer,(TZ03R200A)	20pF,±0.05pF,100V		
C48	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C49	Cer,(CC92PH1H101JY)	100pF,±5%,50V		
C50	Var,Cer,(TZ03R200A)	20pF,±0.02pF,100V		
C51	Var,Cer,(TZ03R200A)	20pF,±0.02pF,100V		
C52	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C53	Cer,(CC92PH1H101JY)	100pF,±5%,50V		
C54	Not assigned			
C55	Elect,(CE04W1E221)	220μF,±20%,25V		
C56	Elect,(CE04W1E221)	220μF,±20%,25V		
C57	Not assigned			
C58	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C59	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C60	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C61	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C62	Not assigned			
C63	Elect,(CE04W1E221)	220μF,±20%,25V		
C64	Elect,(CE04W1E221)	220μF,±20%,25V		
C65	Not assigned			
C66	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C67	Elect,(CE04W1J010)	1μF,±20%,63V		
C68	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C69	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C70	Elect,(CE04W1J010)	1μF,±20%,63V		
C71	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C72	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C73	Cer,(CC45CH1H180JY)	18pF,±5%,50V		
C74	Cer,(CC45CH1H220JY)	22pF,±5%,50V		
C75	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C76	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C77	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C78	Not assigned			
C79	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C80	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C81	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C82	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C83	Not assigned			
C84	Elect,(CE04W1J010)	1μF,±20%,63V		
C85	Elect,(CE04W1E221)	220μF,±20%,25V		
C86	Not assigned			
C87	Not assigned			
C88	Not assigned			
C89	Not assigned			
C90	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
C91	Cer,(CC924CH1H221J)	220pF,±5%,50V		QP Equipment
C92	Cer,(CC924CH1H221J)	220pF,±5%,50V		QP Equipment
C93	Not assigned			
C94	Plast,(ECQ-V1H474JW)	0.47μF,±5%,50V		QP Equipment
C95	Elect,(CE04C1J100)	10μF,±20%,63V		QP Equipment
C96	Elect,(CE04C1J100)	10μF,±20%,63V		QP Equipment
C97	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		QP Equipment
C98	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		QP Equipment
C99	Cer,(CC45CH1H330JY)	33pF,±5%,50V		
C100	Cer,(CC45CK1H020C)	2pF,±0.25pF,50V		
C101	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C102	Cer,(CC45CH1H100DY)	10pF,±0.5pF,50V		
C103	Cer,(CC45CH1H220JY)	22pF,±5%,50V		
C104	Not assigned			
C105	Cer,(CC45CH1H680JY)	68pF,±5%,50V		
C106	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C107	Cer,(CC45CH1H560JY)	56pF,±5%,50V		
C108	Csr,(CC45CH1H090JY)	9pF,±5%,50V		
C109	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C110	Cer,(CC45CH1H090JY)	9pF,±5%,50V		
C111	Not assigned			
C112	Cer,(CC45CH1H090JY)	9pF,±5%,50V		
C113	Not assigned			
C114	Cer,(CC45CH1H090JY)	9pF,±5%,50V		
C115	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C116	Cer,(CC45CH1H560JY)	56pF,±5%,50V		
C117	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C118	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C119	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C120	Cer,(CC45CH1H300JY)	30pF,±5%,50V		
C121	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C122	Elect,(CE04W1E221)	220μF,±20%,25V		
C123	Elect,(CE04W1E221)	220μF,±20%,25V		
C124	Elect,(CE04W1E221)	220μF,±20%,25V		
C125	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C126	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C127	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C128	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C129	Elect,(CE04W1E221)	220μF,±20%,25V		
C130	Elect,(CE04W1E221)	220μF,±20%,25V		
C131	Cer,(CC45CH1H101JY)	100pF,±5%,50V		
C132	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C133	Elect,(CE04W1J010)	1μF,±20%,63V		
C134	Elect,(CE04W1J010)	1μF,±20%,63V		
C135	Elect,(CE04W1J010)	1μF,±20%,63V		

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
C136	Elect,(CE04W1J010)	1μF,±20%,63V		
C137	Elect,(CE04W1J010)	1μF,±20%,63V		
C138	Elect,(CE04W1J010)	1μF,±20%,63V		
C139	Elect,(CE04W1J010)	1μF,±20%,63V		
C140	Elect,(CE04W1J010)	1μF,±20%,63V		
C141	Cer,(CC45CH1H330JY)	33pF,±5%,50V		QP Equipment
C142	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C143	Elect,(CE04W1E221)	220μF,±20%,25V		
J 1	Connector, (27DP-LR-PC)			
J 2	Connector, (DF1-3P-2.5DSA)			
J 3	Connector,(U-SA1501)			
J 4	Not assigned			
J 5	Connector, (DF1-10P-2.5DSA)			
J 6	Plug, (008261-024200-870)			
J 7	Connector, (008261-033311-852)			
J 8	Plug, (008261-024200-870)			
J 9	Connector, (008261-033311-852)			
J 10	Plug, (008261-024200-870)			
J 11	Connector, (008261-033311-852)			
J 12	Plug, (008261-024200-870)			
J 13	Connector, (008261-033311-852)			
J 14	Plug, (008261-024200-870)			
J 15	Connector, (008261-033311-852)			
K 1	Relay,(SZ-2103)			
K 2	Relay,(SZ-2103)			
K 3	Relay,(SZ-2103)			
K 4	Relay,(SZ-2103)			
K 5	Relay,(SZ-2103)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
L 1	Coil,(SP0408-4R7K)	4.7µH		
L 2	Coil,(10K17-45T)	158mH		
L 3	Coil,(10K)	5.46µH		
L 4	Coil,(10K)	2.0µH		(439T22960B)
L 5	Not assigned			
L 6	Coil,(10K17-45T)	158mH		
L 7	Coil,(SP0408-4R7K)	4.7µH		
L 8	Coil,(LF8-101K)	100µH		
L 9	Not assigned			
L10	Not assigned			
L11	Not assigned			
L12	Coil,(SP0408-2R2K)	2.2µH		
L13	Coil,(LF8-101K)	100µH		
L14	Coil,(LF8-101K)	100µH		
L15	Coil,(1)			
L16	Coil,(1)			
L17	Coil,(LF8-101K)	100µH		
L18	Coil,(LF8-101K)	100µH		
L19	Not assigned			
L20	Not assigned			
L21	Coil,(1)			
L22	Coil,(1)			
L23	Not assigned			
L24	Not assigned			
L25	Coil,(LF8-101K)	100µH		
L26	Coil,(LF8-101K)	100µH		
L27	Coil,(FS1012S-152K)	1.5mH		
L28	Coil,(LH1-471K)	470µH		
L29	Coil,(SP0408-R68K)	0.68µH		
L30	Coil,(SP0408-3R3K)	3.3µH		
Q 1	Di,(1SV34)			
Q 2	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 3	Tr,(2SC2901)			
Q 4	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 5	Tr,(2SC2901)			
Q 6	Di,(1S953)			
Q 7	Not assigned			
Q 8	Not assigned			
Q 9	Tr,(2SC2901)			
Q10	IC,(7406)			
Q11	IC,(7406)			
Q12	Tr,(2SC943KL)			
Q13	IC,(TC4051BP)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
Q14	Not assigned			
Q15	Di,(1S953)			
Q16	IC,(TC4051BP)			
Q17	Di,(1S953)			
Q18	IC,(7406)			
Q19	Di,(1S953)			
Q20	Tr,(2SC943K.L)			
Q21	Not assigned			
Q22	Not assigned			
Q23	IC,(TC4051BP)			
Q24	Di,(1S953)			
Q25	IC,(TC4051BP)			
Q26	Di,(1S953)			
Q27	IC,(TC4053BP)			
Q28	Not assigned			
Q29	Tr,(2SA1206)			
Q30	Tr,(2SC945)			
Q31	Tr,(2SC945)			
Q32	Tr,(2SC945)			
Q33	Di,(1SS97)			
Q34	Di,(1SS97)			
Q35	IC,(LM833N)			
Q36	IC,(LF356N)			
Q37	IC,(LM833N)			
Q38	IC,(TC4053BP)			
Q39	IC,(TC4051BP)			
Q40	IC,(TC4099BP)			
Q41	IC,(TC4099BP)			
Q42	Not assigned			
Q43	Not assigned			
Q44	Not assigned			
Q45	Not assigned			
Q46	IC,(TC4099BP)			
Q47	IC,(TC4099BP)			
Q48	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q49	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q50	Not assigned			
Q51	Tr,(2SC943KL)			
Q52	Tr,(2SA1206)			
Q53	Di,(1S953)			
Q54	Di,(1S953)			
Q55	Di,(1S953)			
Q56	Di,(1S953)			
Q57	Tr,(2SC1826S)			
Q58	Tr,(2SA1154)			

( ): Manufacturer's part number
* : Selected at factory 6-20

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
Q59	Not assigned			
Q60	Not assigned			
Q61	IC,(CA3130T)			QP Equipment
Q62	Di,(1SS97)			QP Equipment
Q63	IC,(LF356N)			QP Equipment
Q64	Not assigned			
Q65	IC,(TO4066BP)			QP Equipment
Q66	Not assigned			
Q67	IC,(µPC803C)			QP Equipment
Q68	IC,(µPA38A)			QP Equipment
Q69	IC,(LM833N)			QP Equipment
Q70	IC,(LF356N)			QP Equipment
Q71	Tr,(2SC943)			QP Equipment
Q72	Di,(1S953)			QP Equipment
Q73	Di,(1S953)			QP Equipment
R 1	Not assigned			
R 2	Not assigned			
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 4	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R 5	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 6	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 7	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 8	CF,(ARD25T120J)	12Ω,±5%,1/4W		
R 9	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R10	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R11	CF,(ARD25T120J)	12Ω,±5%,1/4W		
R12	Not assigned			
R13	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R14	Not assigned			
R15	Not assigned			
R16	MF,(RN14K2E1580D)	158Ω,±0.5%,1/4W		
R17	MF,(RN14K2E5490D)	549Ω,±0.5%,1/4W		
R18	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R20	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R21	MF,(RN14K2E1240D)	124Ω,±0.5%,1/4W		
R22	MF,(RN14K2E5760D)	576Ω,±0.5%,1/4W		
R23	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R24	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R25	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R26	CF,(ARD25T820J)	82Ω,±5%,1/4W		
R27	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R28	MF,(RN14K2E1331D)	1.33kΩ,±0.5%,1/4W		
R29	MF,(RN14K2E6040D)	604Ω,±0.5%,1/4W		
R30	MF,(RN14K2E3570D)	357Ω,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
R31	MF,(RN14K2E2210D)	220Ω,±0.5%,1/4W		
R32	Not assigned			
R33	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R34	MF,(RN14K2E1000D)	100Ω,±0.5%,1/4W		
R35	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R36	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R37	Not assigned			
R38	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R39	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R40	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R41	MF,(RN14K2E1822D)	18.2kΩ,±0.5%,1/4W		
R42	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R43	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R44	Not assigned			
R45	MF,(RN14K2E1822D)	18.2kΩ,±0.5%,1/4W		
R46	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R47	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R48	Not assigned			
R49	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R50	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R51	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R52	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R53	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R54	Not assigned			
R55	Not assigned			
R56	Not assigned			
R57	Not assigned			
R58	Not assigned			
R59	MF,(RN14K2E1822D)	18.2kΩ,±0.5%,1/4W		
R60	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R61	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R62	Not assigned			
R63	MF,(RN14K2E1822D)	18.2kΩ,±0.5%,1/4W		
R64	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R65	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R66	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R67	Not assigned			
R68	Not assigned			
R69	Not assigned			
R70	Not assigned			
R71	Not assigned			
R72	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R73	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R74	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W		
R75	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
R76	MF,(RN14K2E1500D)	150Ω,±0.5%,1/4W		
R77	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R78	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R79	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R80	Not assigned			
R81	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R82	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R83	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R84	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R85	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R86	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R87	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R88	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R89	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R90	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R91	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R92	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R93	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R94	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R95	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R96	Not assigned			
R97	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R98	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R99	Not assigned			
R100	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R101	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R102	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R103	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R104	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R105	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R106	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R107	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R108	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R109	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R110	Not assigned			
R111	CF,(ARD25T681J)	680Ω,±5%,1/4W		QP Equipment
R112	CF,(ARD25T681J)	680Ω,±5%,1/4W		QP Equipment
R113	Not assigned			
R114	Not assigned			
R115	Not assigned			
R116	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		QP Equipment
R117	CF,(ARD25T274J)	270kΩ,±5%,1/4W		QP Equipment
R118	CF,(ARD25T684J)	680kΩ,±5%,1/4W		QP Equipment
R119	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		QP Equipment
R120	MF,(RN14K2E2872D)	28.7kΩ,±0.5%,1/4W		QP Equipment

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
R121	MF,(RN14K2E1152D)	11.5kΩ,±0.5%,1/4W		
R122	MF,(RN14K2E1152D)	11.5kΩ,±0.5%,1/4W		
R123	MF,(RN14K2E2872D)	28.7kΩ,±0.5%,1/4W		
R124	MF,(RN14K2E3651D)	3.65kΩ,±0.5%,1/4W		QP Equipment
R125	CF,(ARD25T102J)	1kΩ,±5%,1/4W		QP Equipment
R126	Not assigned			
R127	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		QP Equipment
R128	CF,(ARD25T224J)	220kΩ,±5%,1/4W		QP Equipment
R129	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		QP Equipment
R130	MF,(LP1/8 68ΩJT54)	68Ω,±5%,1/8W		QP Equipment
R131	MF,(RN14K2E7680D)	768Ω,±0.5%,1/4W		QP Equipment
R132	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R133	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R134	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R135	Not assigned			
R136	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R137	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R138	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R139	CF,(ARD25T510J)	51Ω,±5%,1/4W		
R140	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R141	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R142	Not assigned			
R143	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R144	Not assigned			
R145	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R146	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R147	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R148	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R149	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R150	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R151	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R152	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R153	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R154	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R155	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R156	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R157	CF,(ARD25T510J)	51Ω,±5%,1/4W		
R158	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R159	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R160	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R161	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R162	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R163	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R164	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R165	CF,(ARD25T470J)	47Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
R166	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R167	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R168	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R169	CF,(ARD25T223J)	22kΩ,±5%,1/4W		QP Equipment
R170	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		QP Equipment
R171	CF,(ARD25T102J)	1kΩ,±5%,1/4W		QP Equipment
R172	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		QP Equipment
R173	CF,(ARD25T223J)	22kΩ,±5%,1/4W		QP Equipment
R174	CF,(ARD25T681J)	680Ω,±5%,1/4W		QP Equipment
R175	CF,(ARD25T473J)	47kΩ,±5%,1/4W		QP Equipment
R176	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		QP Equipment
R177	Not assigned			
R178	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		QP Equipment
R179	CF,(ARD25T473J)	47kΩ,±5%,1/4W		QP Equipment
R180	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		QP Equipment
R181	CF,(ARD25T473J)	47kΩ,±5%,1/4W		QP Equipment
R182	CF,(ARD25T471J)	470Ω,±5%,1/4W		QP Equipment
R183	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		QP Equipment
R184	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		QP Equipment
R185	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R186	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		QP Equipment
R187	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		QP Equipment
X 1	XTAL OSC,(3.5MHz)			
X 2	XTAL OSC,(3.5MHz)			
X 3	XTAL OSC,(3.5MHz)			
X 4	XTAL OSC,(3.5MHz)			
Z 1	MIXER,(M-8)			
Z 2	HYB,(MT05)			
Z 3	HYB,(MT05)			
Z 4	HYB,(MT04)			
Z 5	Not assigned			
Z 6	HYB,(MT03)			
Z 7	HYB,(MT02)			
Z 8	HYB,(MT03)			
Z 9	HYB,(MT02)			
Z 10	HYB,(MT04)			
Z 11	Not assigned			
Z 12	HYB,(MT03)			
Z 13	HYB,(MT02)			
Z 14	HYB,(MT03)			
Z 15	HYB,(MT02)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : IF 7

CKT REF	DESCRIPTION	RATING		NOTE
Z16	HYB,(MT06)			
Z17	HYB,(MT07A)			
Z18	HYB,(MT07B)			
Z19	HYB,(MT07C)			
Z20	Not assigned			
Z21	TD308A,(24.9MHz)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 2	Elect,(CE04W1J220)	22μF,±20%,63V		
C 3	Elect,(CE04W1E101)	100μF,±20%,25V		
C 4	M Plast, (CF922N2A224K)	0.22μF,±10%,100V 0.		
C 5	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 6	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 7	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 8	M Plast, (CF922N2A105K)	1μF,±10%,100V 1 F,		
C 9	Cer,(CK45D1H472MY)	4700pF,±20%,50V		
C10	Cer,(CK45D1H472MY)	4700pF,±20%,50V		
C11	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C12	Elect,(CE04W1J220)	22μF,±20%,63V		
C13	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C14	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C15	Cer,(CC45CH1H270JY)	27pF,±5%,50V		
C16	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C17	Elect,(CE04W1E101)	100μF,±20%,25V		
C18	Elect,(CE04W1E101)	100μF,±20%,25V		
C19	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C20	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C21	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C22	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C23	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C24	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C25	Not assigned			
C26	Not assigned			
C27	Not assigned			
C28	Not assigned			
C29	Not assigned			
C30	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C31	Elect,(CE04W1J4R7)	4.7μF,±20%,63V		
C32	Cer,(CC45CH1H470JY)	47pF,±5%,50V		
C33	Cer,(CC45CH1H470JY)	47pF,±5%,50V		
C34	Elect,(CE04W1J010)	1μF,±20%,63V		
C35	Cer,(CC45CH1H101JY)	100pF,±5%,50V		
C36	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C37	Not assigned			
C38	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C39	Cer,(RPE131C333K50)	0.033μF,±10%,50V		
C40	Elect,(CE04W1E101)	100μF,±20%,25V		
C41 to C52	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
C53	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C54	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C55	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C56	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C57	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C58	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C59	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C60	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
J 1	Connector, (DF1-15P2.5DS)			
J 2	Not assigned			
J 3	Connector,(U-PA1519)			
J 4	Not assigned			
J 5	Connector, (DF1-10P2.5DS)			
J 6	Connector, (DF1-10P2.5DS)			
J 7	Connector, (27DP-LR-PC)			
J 8	Not assigned			
J 9	Not assigned			
J10	Not assigned			
J11	Not assigned			
J12	Not assigned			
J13	Connector, (HIF3-40P-2.54DS)			
J14	Connector, (DF1-20P2.5DS)			
J15	Connector, (DF1-5P2.5DS)			
J16	Connector, (27DP-LR-PC)			
J17	Connector, (DF1-8P2.5DS)			
Q 1	Not assigned			
Q 2	IC,(μPA56C)			
Q 3	IC,(μPA64H)			
Q 4	IC,(μPA67C)			
Q 5	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 6	IC,(TC4099BP)			
Q 7	IC,(TC4099BP)			
Q 8	IC,(TC4099BP)			
Q 9	IC,(TC4099BP)			
Q10	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
Q11	Not assigned			
Q12	Not assigned			
Q13	Not assigned			
Q14	IC,(TC40H042P)			
Q15	IC,(LM833N)			
Q16	Not assigned			
Q17	Not assigned			
Q18	Not assigned			
Q19	Not assigned			
Q20	Di,(1S953)			
Q21	Di,(1SS97)			
Q22	Di,(1SS149(H))			
Q23	IC,(μPC803C)			
Q24	Not assigned			
Q25	IC,(TC4053BP)			
Q26	Not assigned			
Q27	Not assigned			
Q28	Not assigned			
Q29	IC,(LM833N)			
Q30	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q31	IC,(LM833N)			
Q32	Di,(1S953)			
Q33	IC,(TC40H273P)			
Q34	IC,(μPC624C)			
Q35	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q36	IC,(μPC803C)			
Q37	IC,(LM833N)			
Q38	Di,(1S953)			
Q39	IC,(μPC272C)			
Q40	IC,(TC4011BP)			
Q41	IC,(TC4013BP)			
Q42	IC,(TC4011BP)			
Q43	IC,(TC4013BP)			
Q44	IC,(TC4011BP)			
Q45	IC,(TC4011BP)			
Q46	Di,(1S953)			
Q47	Not assigned			
Q48	IC,(LM833N)			
Q49	Not assigned			
Q50	IC,(LM833N)			
Q51	Not assigned			
Q52	IC,(TC40H273P)			
Q53	IC,(μPC624C)			
Q54	IC,(LM833N)			
Q55	IC,(TC4053BP)			
Q56	IC,(TC4051BP)			
Q57	IC,(TC4053BP)			
Q58	IC,(TC4066BP)			
Q59	IC,(TC4053BP)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
Q60	Tr,(2SA1206)			
Q61	Not assigned			
Q62	Not assigned			
Q63	Not assigned			
Q64	Not assigned			
Q65	Not assigned			
Q66	Not assigned			
Q67	Not assigned			
Q68	Not assigned			
Q69	Not assigned			
Q70	Not assigned			
Q71	IC,(TC4013BP)			
Q72	IC,(TC4013BP)			
Q73	IC,(TC4013BP)			
Q74	IC,(TC4013BP)			
Q75	IC,(TC4532BP)			
Q76	IC,(TC4028BP)			
Q77	IC,(MSM80C85)			
Q78	IC,(PST518A)			
Q79	IC,(TC40H004P)			
Q80	IC,(TC40H155P)			
Q81	IC,(TC40H373P)			
Q82	IC,(TC40H373P)			
Q83	IC,(HN482764)			
Q84	IC,(TC40H138P)			
Q85	IC,(MSM81C55RS)			
Q86	IC,(MSM81C55RS)			
Q87	IC,(TC4047BP)			
Q88	IC,(HN462732G)			
Q89	IC,(HN462732G)			
Q90	IC,(TC4013BP)			
Q91	IC,(μPD7002C)			
Q92	Not assigned			
Q93	IC,(TC40H000P)			
Q94	IC,(TC40H390P)			
Q95	IC,(TC40H004P)			
Q96	IC,(TC40H004P)			
Q97	IC,(TC4011BP)			
Q98	IC,(MSM82C53RS)			
Q99	IC,(7403)			
R 1	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 2	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 3	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 4	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 5	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
R 6	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 7	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R 8	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 9	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R10	MF,(RN14K2E2212D)	22.1kΩ,±0.5%,1/4W		
R11	MF,(RN14K2E3012D)	30.1kΩ,±0.5%,1/4W		
R12	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R13	MF,(RN14K2E2212D)	22.1kΩ,±0.5%,1/4W		
R14	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R15	Not assigned			
R16	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R17	Not assigned			
R18	Var,MF,(RJ-6S 5kΩ)	5kΩ,1/2W		
R19	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R20	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R21	Var,MF,(RJ-6S 2kΩ)	2kΩ,1/2W		
R22	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R23	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R24	CF,(ARD25T150J)	15Ω,±5%,1/4W		
R25	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R26	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R27	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R28	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R29	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R30	Not assigned			
R31	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R32	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R33	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R34	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R35	MF,(RN14K2E2871D)	2.87kΩ,±0.5%,1/4W		
R36	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R37	CF,(ARD25T824J)	820kΩ,±5%,1/4W		
R38	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R39	MF,(RN14K2E3651D)	3.65kΩ,±0.5%,1/4W		
R40	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R41	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R42	Not assigned			
R43	Not assigned			
R44	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R45	Not assigned			
R46	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R47	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R48	Not assigned			
R49	Not assigned			
R50	Var,MF,(RJ-6S 5kΩ)	5kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
R51	Not assigned			
R52	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R53	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R54	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R55	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R56	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R57	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R58	MF,(RN14K2E4021D)	4.02kΩ,±0.5%,1/4W		
R59	MF,(RN14K2E2001D)	2.00kΩ,±0.5%,1/4W		
R60	MF,(RN14K2E2001D)	2.00kΩ,±0.5%,1/4W		
R61	MF,(RN14K2E9091D)	9.09kΩ,±0.5%,1/4W		
R62	MF,(RN14K2E9090D)	909Ω,±0.5%,1/4W		
R63	MF,(RN14K2E90R9D)	90.9Ω,±0.5%,1/4W		
R64	MF,(RN14K2E10R0D)	10.0Ω,±0.5%,1/4W		
R65	Not assigned			
R66	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R67	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R68	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R69	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R70	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R71	CF,(ARD25T753J)	75kΩ,±5%,1/4W		
R72	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R73	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R74	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R75	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R76	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R77	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R78	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R79	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R80	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R81	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R82	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R83	Not assigned			
R84	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R85	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R86	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R87	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R88	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R89	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R90	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R91	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R92	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R93	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R94	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R95	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
R96	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R97	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R98	Var,MF,(RJ-6S 5kΩ)	5kΩ,1/2W		
R99	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R100	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R101	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R102	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R103	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R104	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R105	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R106	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R107	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R108	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R109	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R110 to R120	Not assigned			
R121	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R122	Single in-line array, (IHR-8-332JA)	3.3kΩ x 8,1/8W		
R123	Single in-line array, (IHR-8-332JA)	3.3kΩ x 8,1/8W		
R124	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R125	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R126	MF,(RN14K2E1211D)	1.21kΩ,±0.5%,1/4W		
R127	Not assigned			
R128	MF,(RN14K2E1001D)	1.00kΩ,±0.5%,1/4W		
R129	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R130	Not assigned			
R131	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		
R132	Var,MF,(RJ-6S 5kΩ)	5kΩ,1/2W		
R133	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R134	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R135	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R136	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R137	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R138	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R139	MF,(RN14K2E2051D)	2.05kΩ,±0.5%,1/4W		
R140	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R141	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R142	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R143	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R144	Not assigned			
R145	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R146	CF,(ARD25T104J)	100kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : SCAN & CPU 10

CKT REF	DESCRIPTION	RATING		NOTE
X 1	LN-X-0008,(4.000MHz)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : CRT DRIVE 12

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 2	Cer,(CC45CH1H220JY)	22pF,±5%,50V		
C 3	Cer,(DE-1710R222K3KV)	2200pF,±10%,3KV		
C 4	Cer,(CC45CH1H101JY)	100pF,±5%,50V		
C 5	Cer,(DE-1710R222K3KV)	2200pF,±10%,3KV		
C 6	M Plast, (CF922N2E104K)	0.1μF,±10%,100V		
C 7	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 8	Cer,(CK924C1H223M)	0.022μF,±20%,50V		
C 9	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C10	Cer,(CK924C1H223M)	0.022μF,±20%,50V		
C11	Elect,(KX100VB3R3)	3.3μF,±20%,100V		
C12	Elect,(KX100VB3R3)	3.3μF,±20%,100V		
C13	Elect,(KX100VB3R3)	3.3μF,±20%,100V		
C14	Elect,(KX100VB3R3)	3.3μF,±20%,100V		
C15	Plast,(ECQ-M1H103KZ)	0.01μF,±10%,50V		
C16	Cer,(DE1710R472K1KV)	4700pF,±10%,1KV		
C17	Cer,(DE1710R472K1KV)	4700pF,±10%,1KV		
C18	Cer,(DE1710R222K3KV)	2200pF,±10%,3KV		
C19	Cer,(DE1710R472K1KV)	4700pF,±10%,1KV		
C20	Cer,(DE1710R222K3KV)	2200pF,±10%,3KV		
C21	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C22	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C23	Elect,(CE04W1E101)	100μF,±20%,25V		
C24	Elect,(CE04W1E101)	100μF,±20%,25V		
J 1	Connector, (DF1-10P-2.5DSA)			
J 2	Connector, (DF1-3P-2.5DSA)			
J 3	Connector, (DF1-15P-2.5DSA)			
J 4	Connector, (DF1-3P-2.5DSA)			
J 5	Connector, (DF1-8P-2.5DSA)			
L 1	Coil,(LH1-471K)	470μH		
L 2	Coil,(LH1-471K)	470μH		

( ): Manufacturer's part number
* : Selected at factory

Parts List : CRT DRIVE 12

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	IC,(7406)			
Q 2	Di,(1S953)			
Q 3	Di,(1S953)			
Q 4	Not assigned			
Q 5	Tr,(2SC2718)			
Q 6	Tr,(2SC2718)			
Q 7	Photo coupler,(PS2006B)			
Q 8	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 9	Tr,(2SA845H)			
Q10	Tr,(2SA845H)			
Q11	Tr,(2SA845H)			
Q12	Tr,(2SA845H)			
Q13	Tr,(2SA845H)			
Q14	Tr,(2SA845H)			
Q15	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q16	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q17	Tr,(2SA1151)			
Q18	Tr,(2SC2718)			
Q19	Tr,(2SC2718)			
Q20	Tr,(2SC1279S)			
Q21	Tr,(2SC1279S)			
Q22	IC,(μPA39A)			
Q23	Tr,(2SC1279S)			
Q24	Tr,(2SC1279S)			
Q25	Tr,(2SC1279S)			
Q26	Tr,(2SC1279S)			
Q27	Tr,(2SC1279S)			
Q28	IC,(μPA39A)			
Q29	Not assigned			
Q30	Tr,(2SC1279S)			
Q31	Tr,(2SC1279S)			
Q32	Di,(1S953)			
Q33	Di,(1S953)			
Q34	Di,(V19E)			
Q35	Di,(V19E)			
Q36	Di,(V19E)			
Q37	Di,(V19E)			
Q38	Di,(ES01F)			
Q39	Di,(ES01F)			
Q40	Di,(ES01F)			
Q41	Rectifier,(MSL4532)			
Q42	Tr,(2SD568)			
Q43	Tr,(2SD568)			
Q44	Tr,(2SA1151)			
Q45	IC,(μPC14312)	+12V		

( ): Manufacturer's part number
* : Selected at factory

Parts List : CRT DRIVE 12

CKT REF	DESCRIPTION	RATING		NOTE
Q46	IC,(μPC16312)	-12V		
Q47	Tr,(2SA1206)			
R 1	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 2	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 4	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 5	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 6	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 7	Not assigned			
R 8	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 9	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R10	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R11	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R12	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R13	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R14	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R15	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R16	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R17	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R18	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R20	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R21	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R22	MF,(RH1HVS 2.4MΩ)	2.4MΩ,±5%,1W		
R23	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R24	MF,(RH2HVS 1.5MΩ)	1.5MΩ,±5%,2W		
R25	MF,(RH1HVS 1.2MΩ)	1.2MΩ,±5%,1W		
R26	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R27	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W		
R28	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R29	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R30	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R31	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R32	CF,(ARD25T563J)	56kΩ,±5%,1/4W		
R33	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R34	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R35	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R36	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R37	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R38	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R39	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R40	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : CPT DRIVE 12

CKT REF	DESCRIPTION	RATING		NOTE
R41	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R42	CF,(ARD25T563J)	56kΩ,±5%,1/4W		
R43	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R44	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R45	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R46	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R47	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R48	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R49	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R50	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R51	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R52	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R53	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R54	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R55	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R56	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R57	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R58	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R59	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R60	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R61	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R62	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R63	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R64	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R65	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R66	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R67	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R68	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R69	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R70	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R71	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R72	MF,(RS1FB 560ΩJ)	560Ω,±5%,1W		
R73	MF,(RS1FB 560ΩJ)	560Ω,±5%,1W		
R74	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R75	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R76	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R77	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R78	Not assigned			
R79	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R80	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R81	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R82	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R83	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R84	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R85	CF,(ARD25T333J)	33kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : CRT DRIVE 12

CKT REF	DESCRIPTION	RATING		NOTE
R86	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R87	CF,(ARD222J)	2.2kΩ,±5%,1/4W		
R88	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R89	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
T 1	Trans,(439T23524)			

( ): Manufacturer's part number
* : Selected at factory

Parts List : YTO DRIVE 14

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Not assigned			
C 2	Elect,(CE04W1J220)	22μF,±20%,63V		
C 3	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 4	Elect,(SM16VB220)	220μF,±20%,16V		
C 5	Cer,(CK924C1H223M)	0.022μF,±20%,50V		
C 6	Elect,(CE04W1E101)	100μF,±20%,25V		
C 7	Tant,(CS-E1C220M)	22μF,±20%,16V		
C 8	Cer,(CK45D1H472MY)	4700pF,±20%,50V		
C 9	Tant,(CS-E1A4R7M)	4.7μF,±20%,10V		
C10	Elect,(CE04W1E101)	100μF,±20%,25V		
C11	Elect,(CE02W1E471)	470μF,±20%,25V		
C12	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C13	Elect,(CE04W1J220)	22μF,±20%,63V		
C14	Elect,(CE04W1J010)	1μF,±20%,63V		
C15	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C16	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C17	Elect,(CE04W1E101)	100μF,±20%,25V		
C18	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C19	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C20	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C21	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
J 1	Not assigned			
J 2	Connector, (DF1-8P-2.5DSA)			
J 3	Connector, (27DP-LR-PC)			
J 4	Connector, (DF1-8P-2.5DSA)			
J 5	Connector, (DF1-10P-2.5DSA)			
J 6	Connector, (27DP-LR-PC)			
K 1	Relay,(SZ-2103)			
L 1	Coil,(LF8-101K)	100μH		
L 2	Coil,(LF8-101K)	100μH		

( ): Manufacturer's part number
* : Selected at factory

Parts List YTO DRIVE 14

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	IC,(LM833N)			
Q 2	Not assigned			
Q 3	Tr,(2SC1826S)			
Q 4	IC,(LM833N)			
Q 5	Tr,(2SC2901)			
Q 6	Di,breakdown,(1SZ53)			
Q 7	IC,(μPC4570C)			
Q 8	Tr,(2SA1206)			
Q 9	Tr,(2SC1826S)			
Q10	Di,(1S2222)			
Q11	Di,(1S953)			
Q12	Not assigned			
Q13	Not assigned			
Q14	Not assigned			
Q15	Not assigned			
Q16	IC,(HI201)			
Q17	Di,breakdown,(1SZ53)			
R 1	Not assigned			
R 2	Not assigned			
R 3	Not assigned			
R 4	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 5	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 6	MF,(RN14K2E2152D)	21.5kΩ,±0.5%,1/4W		
R 7	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 8	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 9	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R10	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R11	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R12	Not assigned			
R13	MF,(RN14K2E5621D)	5.62kΩ,±0.5%,1/4W		
R14	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R15	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R16	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R17	MF,(RN14K2E1000D)	100Ω,±0.5%,1/4W		
R18	MF,(RN14K2E2051D)	2.05kΩ,±0.5%,1/4W		
R19	Not assigned			
R20	Not assigned			
R21	Not assigned			
R22	Not assigned			
R23	Not assigned			
R24	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R25	MF,(RN14K2E4641D)	4.64kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : YTO DRIVE 14

CKT REF	DESCRIPTION	RATING		NOTE
R26	MF,(RN14K2E3011D)	3.01kΩ,±0.5%,1/4W		
R27	MF,(RN05E2B5601B)	5.6kΩ,±0.1%,1/8W		
R28	Not assigned			
R29	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R30	MF,(RN14K2E8060D)	806Ω,±0.5%,1/4W		
R31	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R32	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R33	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R34	MF,(RHF-10 33ΩF)	33Ω,±1%,10W		
R35	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R36	Not assigned			
R37	Not assigned			
R38	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R39	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W		
R40	Not assigned			
R41	MF,(RN14K2E1212D)	12.1kΩ,±0.5%,1/4W		
R42	MF,(RN14K2E3010D)	301Ω,±0.5%,1/4W		
R43	MF,(RN14K2E1212D)	12.1kΩ,±0.5%,1/4W		
R44	MF,(RN14K2E2051D)	2.05kΩ,±0.5%,1/4W		
R45	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R46	Not assigned			
R47	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R48	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R49	MF,(RN14K2E8251D)	8.25kΩ,±0.5%,1/4W		
R50	MF,(RN14K2E1431D)	1.43kΩ,±0.5%,1/4W		
R51	MF,(RN14K2E1431D)	1.43kΩ,±0.5%,1/4W		
R52	MF,(RN14K2E1131D)	1.13kΩ,±0.5%,1/4W		
R53	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R54	MF,(RN14K2E2212D)	22.1kΩ,±0.5%,1/4W		
R55	MF,(RN14K2E3322D)	33.2kΩ,±0.5%,1/4W		
R56	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R57	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R58	MF,(RN14K2E4751D)	4.75kΩ,±0.5%,1/4W		
R59	MF,(RN14K2E4641D)	4.64kΩ,±0.5%,1/4W		
R60	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R61	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R62	MF,(RN05E2B3901B)	3.9kΩ,±0.1%,1/8W		
R63	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R64	MF,(RN14K2E8060D)	806Ω,±0.5%,1/4W		
R65	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R66	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Parts List : RF CONVERTER 16

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 2	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 3	Elect,(CE04W1E470)	47μF,±20%,25V		
C 4	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		Q'ty 2
C 5	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		Q'ty 2
C 6	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 7	Elect,(CE04W1E470)	47μF,±20%,25V		
C 8	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 9	**Cer,(CC45CK1H0R5CY)**	**0.5pF,±0.25pF,50V**		**(Adjustment)**
C10	**Cer,(CC45CK1H0R5CY)**	**0.5pF,±0.25pF,50V**		**(Adjustment)**
J 1	Connector,(HRM304B)			
J 2	Connector,(27DP-BR)			
J 3	Connector,(HRM304B)			
J 4	Connector,(HRM304B)			
J 5	Connector,(HRM304B)			
J 6	Not assigned			
J 7	Connector,(27DP-BR)			
R 1	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 2	CF,(ARD25T331J)	330Ω,±5%,1/4W		
Z 1	LPF,(0 to 2GHz)			
Z 2	1st MIX,(0 to 2GHz)			
Z 3	PAD,(6dB)			
Z 4	PRE AMP,(2.5214GHz)			
Z 5	2nd CONVERTER			
Z 6	Not assigned			
Z 7	LO AMP,(2.5 to 4.5GHz)			
Z 8	OSC,(2.5GHz)			
Z 9	Not assigned			
Z10	OSC,(50MHz)			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : 2nd CONVERTER 17

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C 2	Cer,(CK734B1H104K)	0.1μF,±10%,50V		
C 3	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C 4	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 5	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 6	Not assigned			
C 7	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 8	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C 9	Cer,(CK734B1H104K)	0.1μF,±10%,50V		
C10	Not assigned			
C11	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C12	Cer,(CC732CH1H040D)	4pF,±0.5pF,50V		
C13	Cer,(CC732CH1H040D)	4pF,±0.5pF,50V		
C14	Ctr,(CC732CH1H060D)	6pF,±0.5pF,50V		
C15	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C16	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C17	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C18	Cer,(CK45B1H102KY)	1000pF,±10%,50V		
C19	Not assigned			
C20	Not assigned			
C21	Not assigned			
C22	Elect,(CE04W1E470)	47μF,±20%,25V		
L 1	Not assigned			
L 2	Not assigned			
L 3	Not assigned			
L 4	Not assigned			
L 5	Not assigned			
L 6	Not assigned			
L 7	Coil,(SP04084R7K)	4.7μH		
L 8	Not assigned			
Q 1	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 2	Tr,(2SC2367)			
Q 3	Di,(ND487R2-3P)			
Q 4	Di,(ND487R2-3P)			
Q 5	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 6	Tr,(2SC2367)			
Q 7	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 8	Tr,(2SC2369)			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : 2nd CONVERTER 17

CKT REF	DESCRIPTION	RATING		NOTE
R 1	MF,(RM73B2B152JD)	1.5kΩ,±5%,1/8W		
R 2	MF,(RM73B2B391JD)	390Ω,±5%,1/8W		
R 3	MF,(RM73B2B471JD)	470Ω,±5%,1/8W		
R 4	MF,(RM73B2B182JD)	1.8kΩ,±5%,1/8W		
R 5	**MF,(RM73B2B510JD)**	**51Ω,±5%,1/8W**		
R 6	Not assigned			
R 7	Not assigned			
R 8	MF,(RM73B2B101JD)	100Ω,±5%,1/8W		
R 9	MF,(RM74B2B101JD)	100Ω,±5%,1/8W		
R10	**MF,(RM73B2B510JD)**	**51Ω,±5%,1/8W**		
R11	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R12	MF,(RM73B2B6R8JD)	6.8Ω,±5%,1/8W		
R13	MF,(RM73B2B6R8JD)	6.8Ω,±5%,1/8W		
R14	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R15	MF,(RM73B2B151JD)	150Ω,±5%,1/8W		
R16	MF,(RM73B2B390JD)	39Ω,±5%,1/8W		
R17	MF,(RM73B2B151JD)	150Ω,±5%,1/8W		
R18	CF,(ARD25T391J)	390Ω,±5%,1/4W		
T 1	Trans,(342T74443)			

( ): Manufacturer's part number
* : Selected at factory

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Parts List : 50MHz OSC 18

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC45CH1H470JY)	47pF,±5%,50V		
C 2	Cer,(CC45CH1H200JY)	20pF,±5%,50V		
C 3	Cer,(CC45CH1H390JY)	39pF,±5%,50V		
C 4	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 5	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 6	Elect,(CE04W1V220)	22μF,±20%,35V		
C 7	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 8	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 9	Not assigned			
C10	Cer,(CC45CH1H101JY)	100pF,±5%,50V		
C11	Cer,(CC45CH1H040CY)	4pF,±0.25pF,50V		
C12	Cer,(CC45CH1H560JY)	56pF,±5%,50V		
L 1	Coil,(10K17-55T)	181mH		
L 2	Coil,(LF8-221K)	220μH		
L 3	Coil,(34L74431L)			
Q 1	FET,(2SK33)			
Q 2	Not assigned			
Q 3	Not assigned			
Q 4	Tr,(2SA1206)			
Q 5	Tr,(2SA1206)			
R 1	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 2	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 3	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 4	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 5	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 6	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 7	CF,(ARD25T6R8J)	6.8Ω,±5%,1/4W		
R 8	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 9	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R10	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R11	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R12	Not assigned			
R13	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R14	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R15	CF,(ARD25T470J)	47Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

34W85990 | 1/1

Parts List : 2.5214 GHz PRE AMP 19

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C 2	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 3	Elect,(CE04W1E470)	47μF,±20%,25V		
C 4	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 5	Cer,(CC732CH1H220J)	22pF,±5%,50V		
C 6	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
Q 1	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 2	Tr,(2SC2585)			
R 1	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 2	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 3	MF,(RM73B2B221JD)	220Ω,±5%,1/8W		
R 4	MF,(RM73B2B220JD)	22Ω,±5%,1/8W		
R 5	MF,(RM73B2B221JD)	220Ω,±5%,1/8W		
R 6	CF,(ARD25T391J)	390Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

34W89578 | 1/1

Parts List : 2.5 to 4.5 GHz LO-AMP 20

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC732CK1H010C)	1pF,±0.25pF,50V		
C 2	Cer,(CC732CK1H020C)	2pF,±0.25pF,50V		
C 3	Cer,(CC732CK1H020C)	2pF,±0.25pF,50V		
C 4	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 5	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 6	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 7	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 8	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C 9	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C10	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C11	Cer,(CC732CH1H101J)	100pF,±5%,50V		
C12	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C13	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C14	Elect,(CE04W1E470)	47μF,±20%,25V		
Q 1	Tr,(2SC2585)			
Q 2	Tr,(FJ451LE)			
Q 3	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 4	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 5	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 6	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
R 1	CF,(RM73B2B470JD)	47Ω,±5%,1/8W		
R 2	CF,(RM73B2B102JD)	1kΩ,±5%,1/8W		
R 3	CF,(RM73B2B151JD)	150Ω,±5%,1/8W		
R 4	CF,(RM73B2B820JD)	82Ω,±5%,1/8W		
R 5	CF,(RM73B2B391JD)	390Ω,±5%,1/8W		
R 6	CF,(RM73B2B220JD)	22Ω,±5%,1/8W		
R 7	CF,(ARD25T4R7J)	4.7Ω,±5%,1/4W		
R 8	CF,(RM73B2B271JD)	270Ω,±5%,1/8W		
R 9	CF,(RM73B2B180JD)	18Ω,±5%,1/8W		
R10	CF,(RM73B2B271JD)	270Ω,±5%,1/8W		
R11	CF,(RM73B2B271JD)	270Ω,±5%,1/8W		
R12	CF,(RM73B2B180JD)	18Ω,±5%,1/8W		
R13	CF,(RM73B2B271JD)	270Ω,±5%,1/8W		
R14	CF,(RM73B2B470JD)	47Ω,±5%,1/8W		

( ): Manufacturer's part number
* : Selected at factory

34W89426 | 1/1

Parts List : 6 dB PAD 21

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Not assigned			
C 2	Cer,(HCC73CH2D * C)	2 to 6pF,±0.25pF,50V		*
R 1	Not assigned			
R 2	Not assigned			
R 3	CF,(RM73B2B151JD)	150Ω,±5%,1/8W		
R 4	CF,(RM73B2B390JD)	39Ω,±5%,1/8W		
R 5	CF,(RM73B2B151JD)	150Ω,±5%,1/8W		
R 6	CF,(RM73B2B * JD)	22 to 82Ω,±5%,1/8W		*

( ): Manufacturer's part number
* : Selected at factory

34W89428 | 1/1

Parts List : DIGITAL SW 22

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector, (DF1-5P-2.5DS)			
S 1	Switch,(BCH10-V111)			

( ): Manufacturer's part number
* : Selected at factory

34W86018 | 1/1

Parts List : Z7 POWER SUPPLY 24

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(ECK-D2H103PE)	0.01μF,+100/-0%,500V		
C 2	Cer,(ECK-D2H103PE)	0.01μF,+100/-0%,500V		
C 3	Elect,(KM63VNSN3300)	3300μF,±20%,63V		
C 4	Elect,(KM63VNSN2200)	2200μF,±20%,63V		
C 5	Elect,(KM63VB-100)	100μF,±20%,63V		
C 6	Elect,(KM63VB-100)	100μF,±20%,63V		
C 7	Elect,(KM63VB-100)	100μF,±20%,63V		
C 8	Cer,(ECK-D2H101KB2)	100pF,±10%,500V		
C 9	Cer,(ECK-D2H101KB2)	100pF,±10%,500V		
C10	Cer,(ECK-D2H101KB2)	100pF,±10%,500V		
C11	Elect,(ECEA1EG102S)	1000μF,+50/-20%,25V		
C12	Elect,(ECEA1EG102S)	1000μF,+50/-20%,25V		
C13	Elect,(ECEA1EG102S)	1000μF,+50/-20%,25V		
C14 to C26	Elect,(ECEA1EG470S)	47μF,+50/-20%,25V		
F 1	Fuse,	1A, AC125V		
F 2	Fuse	1A, AC125V		
F 3	Fuse	1A, AC125V		
J 1	Connector, (DF1-8P-2.5DS)			
J 2	Connector, (DF1-20P-2.5DS)			
J 3	Connector, (DF1-20P-2.5DS)			
J 4	Connector,(1625-4R)			
J 5	Connector,(1625-4P-1)			
J 6 to J22	Not assigned			
J23	Connector, (DF1-8S-2.5R24)			
L 1	Choke coil,(HP-023)			
L 2	Choke coil,(SR-02-025)			
L 3	Choke coil,(HP-023)			
M 1	Timer			

( ): Manufacturer's part number
* : Selected at factory

Parts List : Z7 POWER SUPPLY 24

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	Rectifier,(RB402)			
Q 2	Di,(VO6C)			
Q 3	Rectifier,(RB152)			
Q 4	IC,(SI-8153B)			
Q 5	IC,(SI-8053B)			
Q 6	IC,(SI-8153B)			
Q 7	IC,(MC7812CT)			or same grade
Q 8	IC,(MC7805CT)			or same grade
Q 9	IC,(MC7912CT)			or same grade
R 1	CF,(RD25S 10kΩJ)	10kΩ,±5%,1/4W		
R 2	CF,(RD25S 1kΩJ)	1kΩ,±5%,1/4W		
R 3	CF,(RD25S 12kΩJ)	12kΩ,±5%,1/4W		
R 4	CF,(RD25S 1kΩJ)	1kΩ,±5%,1/4W		
R 5	CF,(RD25S 1MΩJ)	1MΩ,±5%,1/4W		
R 6	CF,(RD25S 470kΩJ)	470kΩ,±5%,1/4W		
R 7	CF,(RD25S 470kΩJ)	470kΩ,±5%,1/4W		
R 8	CF,(RD25S 3.3kΩJ)	3.3kΩ,±5%,1/4W		
R 9	CF,(RD25S 470kΩJ)	470kΩ,±5%,1/4W		
T 1	Trans			

( ): Manufacturer's part number
* : Selected at factory

Parts List : XYZ OUTPUT 25

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
J 1	Connector, (DF1-8P-2.5DS)			
J 2	Connector, (DF1-8P-2.5DS)			
Q 1	IC,(LM833N)			
Q 2	Tr,(2SC943KL)			
R 1	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 2	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 3	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 4	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 5	Not assigned			
R 6	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 7	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 8	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 9	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R10	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R11	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

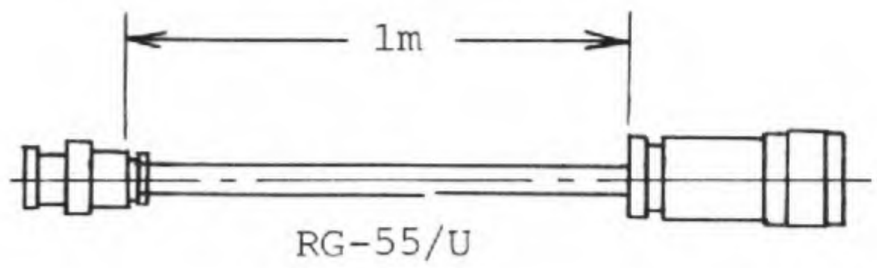
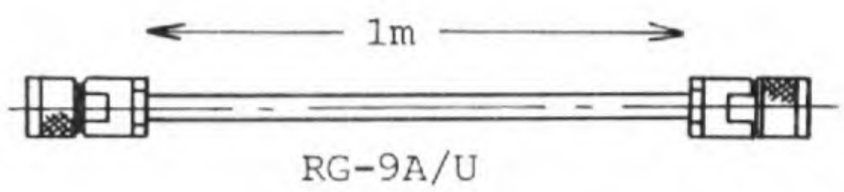
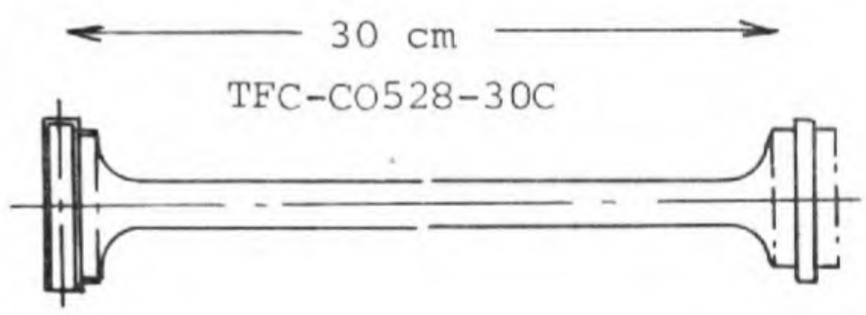
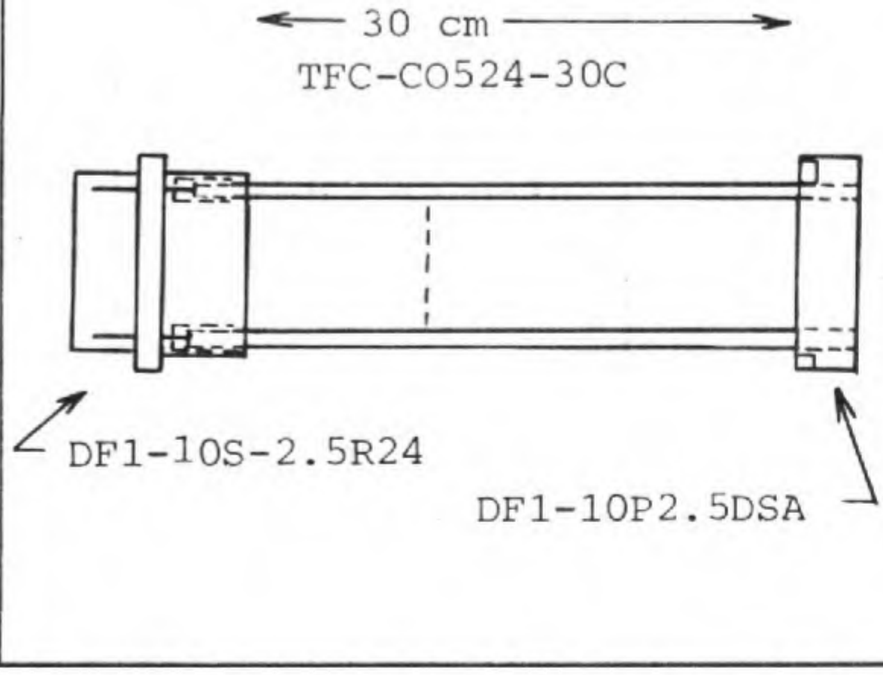
Parts List : CF-IE (Option 01) 26

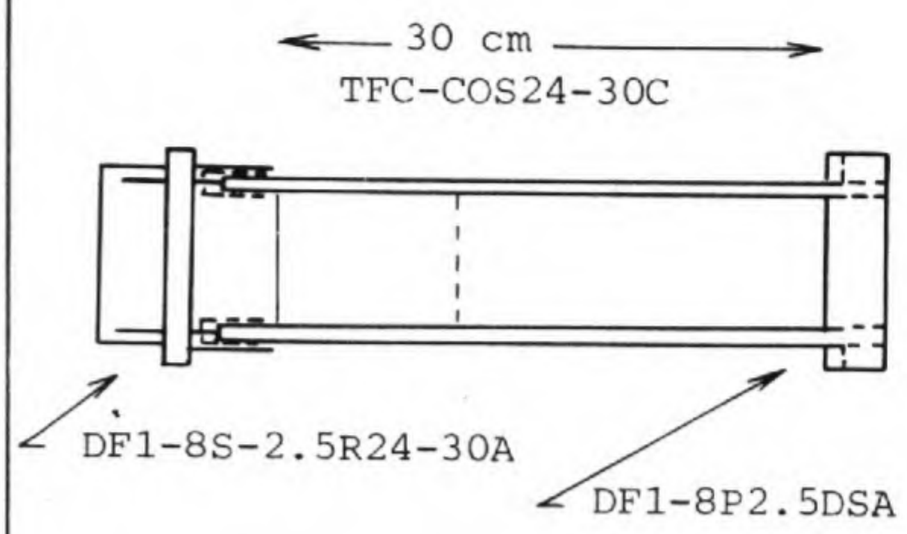
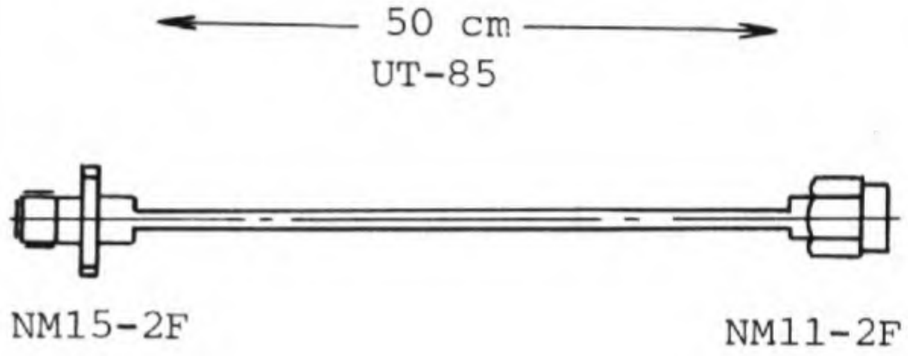
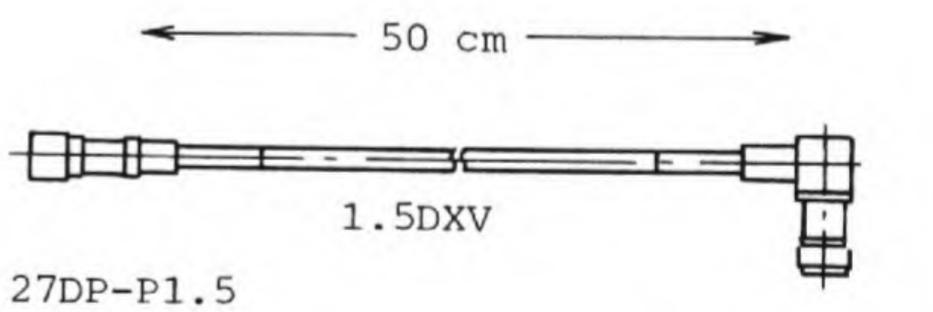
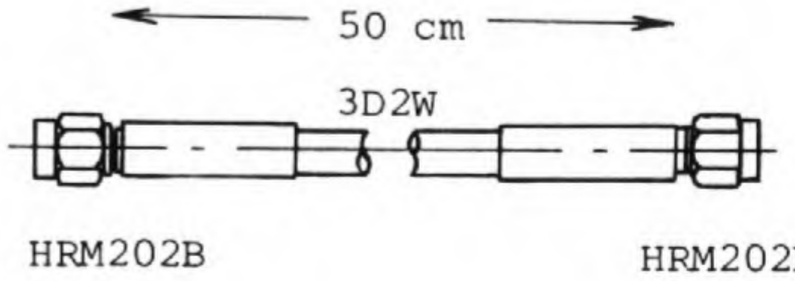
CKT REF	DESCRIPTION	RATING		NOTE
C 1 to C11	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C12	Cer,(CK924C1H222M)	2200pF,±20%,50V		
J 1	Connector, (57LE-20240-27COD35)			
J 2	Connector, (HIF2BA-40D-BA-20S)			
J 3	Terminal cable, (27DP-PC)			349J79737N
Q 1	IC,(μPD7210)			
Q 2	IC,(TC40H367P)			
Q 3	IC,(SN75160N)			
Q 4	IC,(SN75161N)			
Q 5	IC,(TC40H000P)			
Q 6	IC,(TC40H032P)			
Q 7	IC,(TC40H273P)			
Q 8	IC,(TC40H175P)			
Q 9	IC,(TC40H175P)			
Q10	IC,(HI-7541JN)			
Q11	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q12	IC,(LM833)			
R 1	Single in-line array, (IHP-6-103JA)	10kΩ x 6,1/8W		
R 2	Var,MF,(RJ-6P-2kΩ)	2kΩ,1/2W		
R 3	Var,MF,(RJ-6P-2kΩ)	2kΩ,1/2W		
R 4	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 5	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 6	Not assigned			
R 7	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 8	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 9	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R10	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
S 1	Switch,(DYS-8)			(No Label)

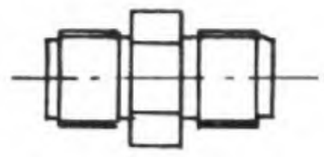
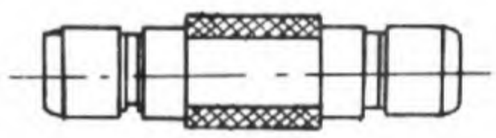
( ): Manufacturer's part number
* : Selected at factory

APPENDIX A

SERVICE KIT

SPEC NO.	ACCESSORY NAME	QTY.	REMARKS
339J1023A	Extender Cable	1	 UG-88/U N-P-55U
349J89076	Extender Cable	1	 UG-21D/U UG-21D/U
339J26234	Extender Cable	1	 U-SA1503 U-PA1522
449J81722D	Extender Cable	1	

SPEC NO.	ACCESSORY NAME	QTY.	REMARKS
449J81722C	Extender Cable	2	
349J89075	Extender Cable	2	
339J24362	Extender Cable	2	
449J25501F	Extender Cable	2	

SPEC NO.	ACCESSORY NAME	QTY.	REMARKS
NO.1305	HRM501 Adapter	2	 HRM501
NO.1289	NS-A009 Adapter-1	2	 27DP-BJ-1.5 27DP-BJ-1.5

Note:

Service kit is sold separately.

When ordering, please include the Spec No., accessory name, and quantity.